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FINAL UNDERGROUND STORAGE TANK MANAGEMENT PLAN VOLUME 1 OF 2 NAB
LITTLE CREEK VA
3/8/1996
DAMES AND MOORE

FINAL UST MANAGEMENT PLAN NAVAL AMPHIBIOUS BASE LITTLE CREEK, NORFOLK, VIRGINIA

Volume I of II

PREPARED FOR:

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ABBREVIATIONS AND ACRONYMS

ACU	Assault Craft Unit
API	American Petroleum Institute
AST	Aboveground Storage Tank
ASTM	American Society for Testing and Materials
Bldg.	Building
CB	Construction Battalion
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980.
CFR	Code of Federal Regulations
DEQ	Department of Environmental Quality
DoD	Department of Defense
DON	Department of Navy
DW	Double Walled
EPA	Environmental Protection Agency
Fed. Reg.	Federal Register
FOR	Fuel Oil Return
FOS	Fuel Oil Suction
FRP	Fiberglass Reinforced Plastic
GPH	Gallons per Hour
LANTDIV	Atlantic Division
LCREEK	Little Creek
LDCP	Leak Detection Control Panel
MSDS	Material Safety Data Sheet
MSL	Mean Sea Level
NAVPHIBASE	Naval Amphibious Base
NACE	National Association of Corrosion Engineers
NFPA	National Fire Protection Association
No.	Number
NR	Non-regulated
OW	Oil Water
O&M	Operations & Maintenance
PEI	Petroleum Equipment Institute
RCRA	Resource Conservation and Recovery Act
SCS	Soil Conservation Service
SPCC	Spill Prevention, Control, and Countermeasures
ST	Storage Tank
STI	Steel Tank Institute
SW	Single Walled
UL	Underwriters Laboratories
USACERL	United States Army Construction Engineering Research Laboratory
USBC	Uniform Statewide Building Code
USGS	United States Geological Survey
UST	Underground Storage Tank
USTMP	Underground Storage Tank Management Plan
VDEQ	(Virginia) Department of Environmental Quality
VR	Virginia Regulation

1.0 INTRODUCTION

1.1 PURPOSE

Dames and Moore was contracted by the U.S. Navy to update an underground storage tank management plan (USTMP) for the Naval Amphibious Base, Little Creek, (NAVPHIBASE LCREEK), Norfolk, Virginia [reference Contract No. N62470-93-D-4034]. NAVPHIBASE LCREEK is located in the City of Virginia Beach, but the mailing address is Norfolk, Virginia. A total of 33 underground storage tanks (USTs), ranging in reported size from 550 gallons to 567,000 gallons, were visited and researched, and are the subject of this USTMP. Four of these USTs are closed-in-place and two are out-of-service, pending removal.

The purpose of developing this plan was stated in the Scope of Work as follows:

The U.S. Navy, as part of its responsibility as a good neighbor and defender of the law, has included in OPNAVINST 5090.1B the requirement that all Naval activities develop and implement a Storage Tank (ST) Management Plan which includes both USTs and aboveground storage tanks (ASTs). In order to more appropriately fulfill the specific needs of NAVPHIBASE LCREEK in complying with this Navy requirement for the preparation and implementation of a comprehensive ST Management Plan, NAVPHIBASE LCREEK elected to prepare a AST and a UST Management Plan separately. This document fulfills the ST Management Plan requirements for USTs only, and is, therefore, referred to as an Underground Storage Tank Management Plan (USTMP). The objective of the USTMP is to identify requirements and outline a course of action to ensure compliance with 40 CFR 280 and state or local regulations concerning USTs, and to prevent damage to human health or the environment from leaking USTs.

The USTMP will be used by NAVPHIBASE LCREEK to manage USTs and for programming future funding requirements for UST-related actions. The USTMP will be an operational document for the activity to use. It shall be designed such that it will assist in managing the operation and maintenance of existing USTs and in planning for the future needs of the USTs.

1.2 ORGANIZATION/DESCRIPTION OF USTMP

The remainder of Section 1.0 provides an overview of the USTMP, the regulatory background for its development and a summary of tanks visited to collect information for plan development.

Section 2.0 presents an overview of significant provisions of current UST regulations including important definitions, exclusions, and deferrals; compliance and reporting deadlines; and permitting, closure, and recordkeeping requirements.

Section 3.0 presents site-specific characteristics (i.e., geology, hydrogeology, climate, etc.) as well as provides a comprehensive list of former USTs that have been removed and clarification of previous and current tank identification numbers (IDs).

Section 4.0 details the assumptions by Dames and Moore in the assessment and evaluation of the NAVPHIBASE LCREEK UST management program, and provides a framework for the formulation of pertinent, effectual recommendations.

Section 5.0 presents general recommendations regarding the NAVPHIBASE LCREEK UST management program, such as personnel training recommendations, recommended procedural requirements for UST construction and supply contractors, recommended technical references, and alternatives to UST systems.

Section 6.0 provides a tank-by-tank technical summary, including individual tank specifications and recommendations for upgrade/replacement alternatives, improperly functioning monitoring systems, etc.

Sections 7.0 and 8.0 are the Navy database and LANTDIV database of USTs.

Section 9.0 provides a list of technical references used in compiling this USTMP.

Figures are included in Appendix A; published regulations and other pertinent technical literature are included in the appendices.

1.3 REGULATORY BACKGROUND

1.3.1 Federal

In 1984, the President of the United States signed into law the Hazardous and Solid Waste Amendments, re-authorizing and amending the Resource Conservation and Recovery Act (RCRA) to include Subtitle I. Subtitle I required the U.S. Environmental Protection Agency (EPA) to develop a comprehensive regulatory program to prevent, detect, and correct releases from USTs storing regulated substances (i.e., hazardous substances and petroleum products).

The final regulations under RCRA Subtitle I were published in 1988 as 40 CFR 280 -- "EPA Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks" (effective date December 23, 1988). A copy of 40 CFR 280 will be included as Appendix B. These regulations established a schedule with specific dates for commencing leak detection, upgrading older USTs, and removal/replacement of older USTs. The regulations also established performance standards for UST systems installed after the effective date of the regulations. Additionally, Subtitle I provides for the enactment of state-level UST regulations "provided they are no less stringent than the corresponding federal requirements." Authorization and approval requirements for state-level UST regulation is provided in 40 CFR 281 -- "Approval of State Underground Storage Tank Programs."

1.3.2 Virginia

1.3.2.1 VR 680-13-02. In October 1989, the Commonwealth of Virginia, in accordance with the provisions of 40 CFR 280, enacted VR 680-13-02 -- "Underground Storage Tanks -- Technical Standards and Corrective Action Requirements," which supersede 40 CFR 280 as follows:

- The federal regulatory definition of a UST specifically excludes any "tank used for storing heating oil for consumptive use on the premises where stored" [40 CFR 280.12]; Virginia regulations exclude only such tanks having a capacity of 5,000 gallons or less [VR 680-13-02(§1.1)].

- Virginia regulations require an approved plan and permit to undertake corrective action [VR 680-13-02(§6.7)]; no such requirements exist under federal regulations.
- Federal regulations exempt notification requirements for tanks taken out of operation on or before January 1, 1974, even though they may still be in the ground [40 CFR 280.22(a)]; Virginia regulations specifically require that "owners of property who have actual knowledge of underground storage tanks on such property that were taken out of service before January 1, 1974, yet still in the ground, must notify the board [the implementing agency] on the notification form" [VR 680-13-02(§2.3.B)].

A copy of VR 680-13-02 as well as VR 680-13-03 (Petroleum UST Financial Requirements) is included as Appendix C.

The Virginia Department of Environmental Quality (DEQ) is the agency that implements and enforces the regulation of USTs in the Commonwealth of Virginia.

1.3.2.2 State Water Control Law

The State Water Control Law, which is provided in Appendix D, regulates oil storage in both regulated and unregulated USTs. Article 11 of the State Water Control Law prohibits the discharge of oil into or upon state waters, lands, or storm drain systems within the Commonwealth of Virginia. If a discharge of oil of any quantity occurs, immediate action is to be implemented to contain and clean up the discharge (or threat of a discharge). A discharge of 25 gallons of oil or more must notify VDEQ. Records of all oil discharges of any quantity, including less than 25 gallons, must be maintained for at least five years. Details on recordkeeping, clean up requirements, reporting requirements and other regulatory requirements are provided in the State Water Control Law.

1.3.3 Local

The Virginia Uniform Statewide Building Code (USBC), which includes the Virginia Statewide Fire Prevention Code, regulates the installation, removal and operation of unregulated and regulated USTs. The Virginia USBC is enforced by the local building officials and the local

fire chief. Sections of the Virginia USBC applicable to USTs are provided in Appendix F; however, the installation or removal of a UST is site specific and sections provided in Appendix F may not be considered comprehensive of all applicable USBC requirements (i.e., removal of UST located beneath a building, etc.). Prior to removing or installing a regulated or unregulated UST, NAVPHIBASE LCREEK must apply for a local permit issued by the local building official. Although the mailing address of NAVPHIBASE LCREEK is the City of Norfolk, the base is actually located in the City of Virginia Beach and is, therefore, responsible for complying with local Virginia Beach regulations.

1.3.4 NAVOPINST

The Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B), which replaces OPNAVINST 5090.1A, provides Navy policy, identifies key statutory and regulatory requirements, and assigns responsibilities for management of Navy programs for:

- Compliance with related laws and regulations.
- Protection of the environment
- Conservation of natural resources
- Preservation of cultural and historic resources
- Pollution prevention

This instruction is intended to improve the internal management of the activities environmental program, and is not intended to create any right or benefit, substantive or procedural, enforceable at law by any party against NAVPHIBASE LCREEK, its officers, employees, or any person. Sections applicable to UST management at NAVPHIBASE LCREEK are provided in Appendix E.

1.4 SITE VISITS

In conjunction with the preparation of this USTMP, Dames and Moore conducted the following field activities:

- Reviewed NAVPHIBASE LCREEK files for documentation, drawings, and other pertinent tank records.

- Visited each UST site to correct, update, and/or confirm research information and to prepare field sketches for inclusion in the USTMP.
- Interviewed NAVPHIBASE LCREEK personnel to gather information regarding past, current, and projected operating procedures and the status of activity UST systems.
- Compiled tank-specific information regarding physical characteristics of USTs.

A total of 33 USTs at 19 different locations were visited: 27 USTs are in active service and 6 USTs have been emptied and removed from service and/or closed in place. Following is a comprehensive (activity-wide) summary of known USTs:

- Eight unleaded gasoline (MOGAS) USTs with capacities ranging from 6,000 to 12,000 gallons supplying motor vehicle fuel and private boats.
- Two USTs with capacities of 4,000 and 6,000 gallons are used to store low-sulphur diesel for motor vehicle fuel; one 6,000 gallon diesel UST supplying fuel to private boats and one 4,000 gallon diesel that supplies fuel to test vessel engines.
- Two diesel USTs used to store fuel for emergency generators; capacities were 600 and 4,000 gallons.
- One 567,000-gallon diesel cut-and-cover UST which is used as a main diesel supply tank for the activity.
- Three 8,000-gallon USTs containing Norpar and Isopar used in research of modules.
- Nine waste oil USTs with capacities ranging from 500 to 10,000 gallons in size.
- Two 8,000-gallon, one 4,000-gallon, and one 550-gallon USTs have been removed from service and closed in place.
- Two 1,000-gallon USTs have been removed from service; removal is pending.

A summary of tank-specific details for known USTs is included in Table 1-1. A reference table of UST locations on the facility wide map is included in Table 1-2. A table of all historical USTs at the installation is provided as Table 1-3.

TABLE 1-1
INVENTORY OF UNDERGROUND STORAGE TANKS
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA

Tank I.D. ¹	Location	Capacity (gallons)	Labeled	Date Installed	Contents	Use	Construction Material
1265-94-1	SIMA Shop	4,000	1265-1	1994	Diesel	Engine Testing	DW-FRP
1265-94-2	SIMA Shop	4,000	1265-2	1994	Waste Oil	WO Collection	DW-FRP
1516-94-3	Marina	6,000		1994	Un. Gasoline	Marine Boat Fuel	DW-FRP
1516-94-4	Marina	6,000		1994	Diesel	Marine Boat Fuel	DW-FRP
1551	Main Diesel Tank	567,000		1951	Diesel	Main Diesel Supply	SW-Concrete
1558-94-1	SURTASS	8,000	1558-1	1994	Norpar	Module Research	DW-FRP
1558-94-2	SURTASS	8,000	1558-2	1994	Norpar	Module Research	DW-FRP
1558-94-3	SURTASS	4,000	1558-3	1994	Waste Oil	WO Collection	DW-FRP
1586	SURTASS	8,000		1993	Isopar	Module Research	DW-FRP
1612-19	CITGO (Gate 1)	10,000	None	1992	Mogas (premium)	Vehicle Fuel	DW-FRP
1612-20	CITGO (Gate 1)	10,000	None	1992	Mogas (mid)	Vehicle Fuel	DW-FRP
1612-21	CITGO (Gate 1)	10,000	None	1992	Mogas (regular)	Vehicle Fuel	DW-FRP
1618-94-1	EOD Area	4,000	None	1994	Diesel (LS)	Vehicle Fuel	DW-FRP
3505-94-1	Hospital	600	None	1994	Diesel	Emergency Generator	DW-FRP
3827-94-1	ACU-4 Wash Rack	600	None	1994	Waste Oil	WO Collection	DW-FRP
3827-2	ACU-4 Wash Rack	550	None (NA)	1986	Sand/Concrete	Closed-in-Place	SW-Steel
3868-3	DC Fuel Farm	10,000	3868	1992	Waste Oil	WO Collection	DW-FRP
	Applied Instructors Bldg. (Warfare School)						
3872-94-1		500	None	1994	Waste Oil	WO Collection	DW-FRP
757-94-1	Steam Plant (NAB)	4,000	None	1994	Diesel	Emergency Generator	DW-FRP
CB124-94-1	CB Operations/Main.	600	124	1994	Waste Oil	WO Collection	DW-FRP
CB301-94-3	CB Operations/Main.	600	None	1994	Waste Oil	WO Collection	DW-FRP
CB301-94-4	CB Operations/Main.	2,500	None	1994	Waste Oil	WO Collection	DW-FRP
CB304-94-1	CB Gas Filling Station	6,000	None	1994	Diesel	Vehicle Fuel	DW-FRP
CB304-94-2	CB Gas Filling Station	6,000	None	1994	Unleaded	Vehicle Fuel	DW-FRP
CB317-94-1	CB Warehouse	1,000	317	1994	Waste Oil	WO Collection	DW-FRP
ECTGO-1	CITGO (Gate 5)	12,000	None	1992	Mogas (mid)	Vehicle Fuel	SW-Fibersteel
ECTGO-2	CITGO (Gate 5)	12,000	None	1991	Mogas (premium)	Vehicle Fuel	SW-Fibersteel
ECTGO-3	CITGO (Gate 5)	12,000	None	1992	Mogas (regular)	Vehicle Fuel	SW-Fibersteel
LSTP-12	Between Pier 12 & 13	1,000	None	1951	Diesel	Out of Service	Steel-CS
LSTP-17	Between Pier 16 & 17	1,000	None	1951	Diesel	Out of Service	Steel-CS
SURTASS-1	SURTASS	8,000	None (NA)	1985	Sand/Concrete	Closed-in-Place	SW-FRP
SURTASS-2	SURTASS	8,000	None (NA)	1985	Sand/Concrete	Closed-in-Place	SW-FRP
SURTASS-3	SURTASS	4,000	None (NA)	1985	Sand/Concrete	Closed-in-Place	SW-FRP

1 = Tank ID references associated building number

CB = Construction Battalion

CS = Concrete Sump

DC = Desert Cove

EOD = Explosive Ordnance Disposal Unit

LS = Low sulfur

FRP = Fiberglass Reinforced Plastic

SIMA = Shore Intermediate Maintenance Activity

WO = Waste Oil

TABLE 1-2

**MAP REFERENCE TABLE
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA**

Tank I.D.¹	Location	Capacity (gallons)	Contents	Use	Map Sheet No.
1265-94-1	SIMA Shop	4,000	Diesel	Engine Testing	4
1265-94-2	SIMA Shop	4,000	Waste Oil	WO Collection	4
1516-94-3	Marina	6,000	Un. Gasoline	Marine Boat Fuel	4
1516-94-4	Marina	6,000	Diesel	Marine Boat Fuel	4
1551	Main Diesel Tank	567,000	Diesel	Main Diesel Supply	1
1558-94-1	SURTASS	8,000	Norpar	Module Research	1
1558-94-2	SURTASS	8,000	Norpar	Module Research	1
1558-94-3	SURTASS	4,000	Waste Oil	WO Collection	1
1586	SURTASS	8,000	Isopar	Module Research	1
1612-19	CITGO (Gate 1)	10,000	Mogas (premium)	Vehicle Fuel	4
1612-20	CITGO (Gate 1)	10,000	Mogas (mid)	Vehicle Fuel	4
1612-21	CITGO (Gate 1)	10,000	Mogas (regular)	Vehicle Fuel	4
1618-94-1	EOD Area	4,000	Diesel (LS)	Vehicle Fuel	1
3505-94-1	Hospital	600	Diesel	Emergency Generator	5
3827-94-1	ACU-4 Wash Rack	600	Waste Oil	WO Collection	2
3827-2	ACU-4 Wash Rack	550	Sand/Concrete	Closed-in-Place	2
3868-3	DC Fuel Farm	10,000	Waste Oil	WO Collection	2
3872-94-1	Applied Instructors Bldg. (Warfare School)	500	Waste Oil	WO Collection	2
757-94-1	Steam Plant (NAB)	4,000	Diesel	Emergency Generator	5
CB124-94-1	CB Operations/Maintenance	600	Waste Oil	WO Collection	2
CB301-94-3	CB Vehicle Maintenance	600	Waste Oil	WO Collection	2
CB301-94-4	CB Vehicle Maintenance	2,500	Waste Oil	WO Collection	2
CB304-94-1	CB Gas Filling Station	6,000	Diesel	Vehicle Fuel	2
CB304-94-2	CB Gas Filling Station	6,000	Unleaded	Vehicle Fuel	2
CB317-94-1	CB Warehouse	1,000	Waste Oil	WO Collection	2
ECTGO-1	CITGO (Gate 5)	12,000	Mogas (mid)	Vehicle Fuel	6
ECTGO-2	CITGO (Gate 5)	12,000	Mogas (premium)	Vehicle Fuel	6
ECTGO-3	CITGO (Gate 5)	12,000	Mogas (regular)	Vehicle Fuel	6
LSTP-12	Between Pier 12 & 13	1,000	Diesel	Out of Service	4
LSTP-17	Between Pier 16 & 17	1,000	Diesel	Out of Service	1
SURTASS-1	SURTASS	8,000	Sand/Concrete	Closed-in-Place	1
SURTASS-2	SURTASS	8,000	Sand/Concrete	Closed-in-Place	1
SURTASS-3	SURTASS	4,000	Sand/Concrete	Closed-in-Place	1

1 = Tank ID references associated building number

CB = Construction Battalion

CS = Concrete Sump

DC = Desert Cove

EOD = Explosive Ordinance Disposal Unit

LS = Low sulfur

FRP = Fiberglass Reinforced Plastic

SIMA = Shore Intermediate Maintenance Activity

WO = Waste Oil

TABLE 1-3

**SUMMARY OF ALL PAST AND PRESENT UST SYSTEMS
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA**

UST ID # ¹	Capacity (gallons)	Content	Status	Location/ Bldg. No.	Date Installed	Date Removed
1231-3	550	Waste Oil	Removed/Replaced w/AST	Bldg. 1231	ND	12/01/90
1231-4	550	Waste Oil	Removed	Bldg. 1231	ND	12/01/90
124	550	Waste Oil	Removed/Replaced	Bldg. 124	ND	1994
1265-1	4,000	Diesel	Removed/Replaced	SIMA Shop	ND	1994
1265-2	1,000	Waste Oil	Removed/Replaced	SIMA Shop	ND	1994
1265-3	1,000	Waste Oil	Removed/Replaced w/Oil/Water Separator	SIMA Shop	ND	01/01/91
1265-4	1,000	Waste Oil	Removed/Replaced w/Oil/Water Separator	SIMA Shop	ND	01/01/91
1265-94-1	4,000	Diesel	Active	SIMA Shop	1994	NA
1265-94-2	4,000	Waste Oil	Active	SIMA Shop	1994	NA
1516-3	4,000	Unl. Gasoline	Removed/Replaced	Marina	ND	1994
1516-4	4,000	Unl. Gasoline	Removed/Replaced	Marina	ND	1994
1516-94-3	6,000	Unl. Gasoline	Active	Marina	1994	NA
1516-94-4	6,000	Diesel	Active	Marina	1994	NA
1518	275	Diesel	Removed/Replaced w/AST	Bldg. 1518	ND	03/01/91
1551	567,000	Diesel	Active	Main Diesel Tank	1951	NA
1558-94-1	8,000	Norpar	Active	SURTASS	1994	NA
1558-94-2	8,000	Norpar	Active	SURTASS	1994	NA
1558-94-3	4,000	Waste Oil	Active	SURTASS	1994	NA
1586	8,000	Isopar	Active	SURTASS	1993	NA
1610-5	6,000	Gasoline	CAP Submitted 04/10/92	Bldg. 1610	ND	05/01/90
1610-6	6,000	Gasoline	CAP Submitted 04/10/92	Bldg. 1610	ND	05/01/90
1612-16	10,275	Gasoline	Removed/Replaced	CITGO (Gate 1)	ND	11/16/92
1612-17	10,275	Gasoline	Removed/Replaced	CITGO (Gate 1)	ND	11/16/92
1612-18	10,275	Gasoline	Removed/Replaced	CITGO (Gate 1)	ND	11/16/92
1612-19	10,000	Mogas (premium)	Active	CITGO (Gate 1)	1992	NA
1612-20	10,000	Mogas (mid)	Active	CITGO (Gate 1)	1992	NA
1612-21	10,000	Mogas (regular)	Active	CITGO (Gate 1)	1992	NA
1618	4,000	Diesel	Removed/Replaced	EOD Area	ND	1994
1618-94-1	4,000	Diesel (LS)	Active	EOD Area	1994	NA
2012	4,000	Diesel	Removed	Bldg. 2012	ND	1994
208	550	Waste Oil	Closed	Bldg. 208	ND	1994
2115	275	Diesel	Removed/Replaced w/AST	Bldg. 2115	ND	03/01/91
214-2	550	Waste Oil	Closed	Bldg. 214	ND	1994
300-1	Unknown	Gasoline	Closed	Bldg. 300	ND	03/01/88
300-2	Unknown	Gasoline	Closed	Bldg. 300	ND	03/01/88
301-1 or (304-1)	6,000	Diesel	Removed/Replaced	Bldg. 301	ND	1994
301-2 or (304-2)	6,000	Unl. Gasoline	Removed/Replaced	Bldg. 301	ND	1994
301-3	2,000	Waste Oil	Removed/Replaced	Bldg. 301	ND	1994
301-4	550	Waste Oil	Removed/Replaced	Bldg. 301	ND	1994
3033	550	Waste Oil	Removed/Bldg. Demo '87	Bldg. 3033	ND	07/01/88
3108-5	550	Waste Oil	Removed/Replaced w/AST	Bldg. 3108	ND	12/01/90

TABLE 1-3 (Cont'd)

UST ID # 1	Capacity (gallons)	Content	Status	Location/ Bldg. No.	Date Installed	Date Removed
3128-7	4,000	Gasoline	Permanently Closed	Bldg. 3128	ND	07/24/90
3128-8	4,000	Gasoline	Permanently Closed	Bldg. 3128	ND	07/24/90
3128-23	6,000	Gasoline	Permanently Closed	Bldg. 3128	ND	05/01/90
3142-1	550	Waste Oil	Removed/Replaced w/AST	Bldg. 3142	ND	02/01/91
315CB	550	Waste Oil	Removed/Not Replaced	Bldg. CB315	ND	12/01/91
317CB	1,000	Waste Oil	Removed/Replaced	Bldg. CB317	ND	1994
3319-1	Unknown	Gasoline	Removed	Bldg. 3319	ND	05/01/90
3319-2	Unknown	Diesel	Removed	Bldg. 3319	ND	05/01/90
3319-19	1,000	Waste Oil	Removed	Bldg. 3319	ND	05/01/90
3329-1	550	Waste Oil	Removed	Bldg. 3329	ND	12/31/91
3329-2	100	Waste Oil	Removed	Bldg. 3329	ND	12/31/91
3404-1	5,500	Gasoline	CAP Submitted 04/10/92	Bldg. 3404	ND	05/01/90
3404-2	5,500	Diesel	CAP Submitted 04/10/92	Bldg. 3404	ND	05/01/90
3505	280	Diesel	Removed/Replaced	Hospital	ND	1994
3505-94-1	600	Diesel	Active	Hospital	1994	NA
3510	ND	ND	Removed	Bldg. 3510	ND	ND
3511	1,000	Unknown	Removed	Bldg. 3511	ND	05/05/89
3530-6	500	Waste Oil	Permanently Closed	Bldg. 3530	ND	07/24/90
3530-7	550	Waste Oil	Removed/Not Replaced	Bldg. 3530	ND	03/01/91
3530-8	550	Waste Oil	Closed/Replaced w/AST	Bldg. 3530	ND	12/01/90
3615-9	10,000	Gasoline	Removed/Not Replaced	Bldg. 3615	ND	12/90
3615-10	10,000	Gasoline	Removed/Not Replaced	Bldg. 3615	ND	03/01/91
3615-11	10,000	Gasoline	Removed/Not Replaced	Bldg. 3615	ND	03/01/91
3615-12	10,000	Gasoline	Removed/Not Replaced	Bldg. 3615	ND	03/01/91
3615-13	10,000	Gasoline	Removed/Not Replaced	Bldg. 3615	ND	03/01/91
3615-14	4,000	Diesel	Removed/Not Replaced	Bldg. 3615	ND	03/01/91
3615-20	550	Waste Oil	Removed/Not Replaced	Bldg. 3615	ND	10/31/89
3661	550	Waste Oil	Removed/Closed	Bldg. 3661	ND	10/06/89
3699-1	500	Diesel	Removed/Replaced w/AST	Bldg. 3699	ND	06/01/91
3699-2	500	Gasoline	Removed/Replaced w/AST	Bldg. 3699	ND	06/01/91
3801	2,000	Fuel Oil	Closed	Bldg. 3801	ND	5/90
3806	200	Solvents	Removed/Not Replaced	Bldg. 3806	ND	12/01/90
3813	200	Naphtha	Removed/Replaced w/AST	Bldg. 3813	ND	03/01/91
3817-1	550	Waste Oil	Removed: MCON P-337	Bldg. 3817	ND	01/01/92
3817-2	550	Waste Oil	Removed: MCON P-337	Bldg. 3817	ND	01/01/92
3823	2,000	Diesel	Removed	Bldg. 3823	ND	1994
3827	550	Waste Oil	Removed	Bldg. 3827	ND	1994
3827-94-1	600	Waste Oil	Active	ACU-4 Wash Rack	1994	NA
3827-2	550	Sand/Concrete	Active	ACU-4 Wash Rack	1986	NA
3860-1	10,000	Waste Fuel/Oil	Removed/Replaced w/UST	Bldg. 3860	ND	10/15/92
3860-2	500	Diesel/ Water	Removed/Closed	Bldg. 3860	ND	10/89
3868-3	10,000	Waste Oil	Active	DC Fuel Farm	1992	NA
3870-1	5,000	Diesel	Removed/Replaced w/AST	Bldg. 3870	ND	03/01/91

TABLE 3-1 (Cont'd)

UST ID # ¹	Capacity (gallons)	Content	Status	Location/ Bldg. No.	Date Installed	Date Removed
3870-2	5,000	Water		Bldg. 3870	ND	1994
3872-3	500	Diesel	Removed/Replaced w/AST	Bldg. 3872	ND	03/01/91
3872-4	500	Waste Oil	Removed/Replaced	Bldg. 3872	ND	1994
3872-94-1	500	Waste Oil	Active	Applied Instructors Bldg. (Warfare School)	1994	NA
3879	550	Diesel	Waiting for CAP Approval	Bldg. 3879	ND	03/01/89
751	55	Diesel	Removed	Bldg. 751	ND	01/01/92
757	ND	ND	Removed	Bldg. 757	ND	ND
757C	5,000	Brine	Removed	Bldg. 757	ND	01/01/89
757-94-1	4,000	Diesel	Active	Steam Plant (NAB)	1994	NA
CB124-94-1	600	Waste Oil	Active	CB O&M	1994	NA
CB301-94-3	600	Waste Oil	Active	CB Vehicle Maintenance	1994	NA
CB301-94-4	2,500	Waste Oil	Active	CB Vehicle Maintenance	1994	NA
CB304-94-1	6,000	Diesel	Active	CB Gas Filling Station	1994	NA
CB304-94-2	6,000	Unl. Gasoline	Active	CB Gas Filling Station	1994	NA
CB317-94-1	1,000	Waste Oil	Active	CB Warehouse	1994	NA
DCOVE-1	ND	ND		ND	ND	1989
DCOVE-2	ND	ND		ND	ND	1989
ECTGO-1	12,000	Mogas (mid)	Active	CITGO (Gate 5)	1992	NA
ECTGO-2	12,000	Mogas (premium)	Active	CITGO (Gate 5)	1991	NA
ECTGO-3	12,000	Mogas (regular)	Active	CITGO (Gate 5)	1992	NA
LSTP-12	1,000	Diesel	Active	Between Pier 12 & 13	1951	NA
LSTP-17	1,000	Diesel	Active	Between Pier 16 & 17	1951	NA
NIDER-1	10,000	Gasoline	CAP Amendment pending	ND	ND	12/01/91
NIDER-2	10,000	Gasoline	CAP Amendment pending	ND	ND	12/01/91
NIDER-3	10,000	Gasoline	CAP Amendment pending	ND	ND	12/01/91
NIDER-4	2,000	Diesel	CAP Amendment pending	ND	ND	12/01/91
NIDER-21	10,000	Gasoline	CAP Amendment pending	ND	ND	12/01/91
NIDER-22	10,000	Gasoline	CAP Amendment pending	ND	ND	12/01/91
NMCR (Bldg. 1) Tank No. 2	660	Diesel	Removed	NMCR, Bldg. 1	ND	5/90
SURTASS-1	8,000	Sand/Concrete	Active	SURTASS	1985	NA
SURTASS-2	8,000	Sand/Concrete	Active	SURTASS	1985	NA
SURTASS-3	4,000	Sand/Concrete	Active	SURTASS	1985	NA
T-9	550	Waste Oil	Removed/Not Replaced	ND	ND	01/01/91

(1) NAB Little Creek applied for permanent closure with the DEQ. Permanent closure approval pending.

¹ Tank ID references associated building number

CB = Construction Battalion

CS = Concrete Sump

DC = Desert Cove

EOD = Explosive Ordnance Disposal Unit

FRP = Fiberglass Reinforced Plastic

LS = Low sulfur

ND = Not Determined

O&M = Operations & Maintenance

SIMA = Shore Intermediate Maintenance Activity

WO = Waste Oil

2.0 OVERVIEW OF UST REGULATIONS

2.1 GENERAL

The following section provides an overview of important UST regulations pertinent to the NAVPHIBASE LCREEK UST management program. It is not intended to be all-encompassing in its scope; however, it may serve as a convenient reference for persons who are already familiar with UST regulations. Information regarding important definitions, exemptions, and exclusions; compliance and reporting deadlines; and permitting, closure, and recordkeeping requirements are highlighted. Regulatory source documents are cited to provide easy reference for further investigation.

2.2 DEFINITIONS [VR 680-13-02(§1.1)]

2.2.1 *Underground Storage Tank (UST)* is defined as "any one or combination of tanks (including underground pipes connected thereto) that is used to contain an accumulation of regulated substances, and the volume of which (including the volume of underground pipes connected thereto) is 10% or more beneath the surface of the ground." This definition is subject to certain exclusions as described in the following section.

2.2.2 *Regulated Substance* is defined as "an element, compound, mixture, solution, or substance that, when released to the environment, may present substantial danger to the public health or welfare, or the environment." Regulated substances include any substance defined in §101(14) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 (excluding hazardous wastes as defined by Subtitle C of RCRA) and petroleum, including crude oil or any fraction thereof, that is a liquid at standard conditions of temperature and pressure.

2.2.3 *Release* means "any spilling, leaking, emitting, discharging, escaping, leaching, or disposing from an UST into groundwater, surface water, or subsurface soils."

2.2.4 "*Owner* means:

1. In the case of an UST system in use on November 8, 1984, or brought into use after that date, any person who owns an UST system used for storage, use, or dispensing of regulated substances; and
2. In the case of any UST system in use before November 8, 1984, but no longer in use on that date, any person who owned such UST immediately before the discontinuation of its use."

2.2.5 "*Person* means an individual, trust, firm, joint stock company, corporation, including a government corporation, partnership, association, any state or agency thereof, municipality, county, town, commission, political subdivision of a state, any interstate body, consortium, joint venture, commercial entity, the government of the United States or any unit or agency thereof."

2.2.6 "*de minimis* means trivial and beyond the intent of regulation, as that term is used at 53 Fed. Reg. 37108-37109.

2.3 EXCLUSIONS

2.3.1 The following tanks are not regulated because they are specifically excluded from the definition of UST [VR 680-13-02(§1.1)]:

- Farm and residential tanks of 1,100 gallons or less capacity used for storing motor fuel for non-commercial purposes;
- Tanks used for storing heating oil for consumption on the premises where stored, except for tanks having a capacity of more than 5,000 gallons and used for storing heating oil;
- Septic tanks;
- Natural gas/hazardous liquid pipeline facilities regulated under the provisions of federal or state laws;
- Surface impoundments, pits, ponds, or lagoons;
- Storm-water or wastewater collection systems;

- Flow-through process tanks;
- Liquid traps or associated gathering lines directly related to oil or gas production and gathering operations;
- Storage tanks situated in an underground area (such as a basement, cellar, mineworking, drift, shaft, or tunnel) if the storage tank is situated upon or above the surface of the floor.

2.3.2 The following tanks are not regulated because they are specifically defined as non-applicable [VR 680-13-02(§1.2.B)]:

- Any UST holding hazardous wastes listed or identified under Subtitle C of the Solid Waste Disposal Act, or a mixture of such hazardous waste and other regulated substances;
- Any wastewater treatment tank system that is part of a wastewater treatment facility regulated under §402 or §307(b) of the Federal Water Pollution Control Act;
- Equipment or machinery that contains regulated substances for operational purposes such as hydraulic lift tanks and electrical equipment tanks;
- Any UST whose capacity is 110 gallons or less;
- Any UST system that contains a *de minimis* concentration of regulated substances; and
- Any emergency spill or overflow containment UST system that is expeditiously emptied after use.

2.4 DEFERRALS

2.4.1 Parts II, III, IV, V, and VII of VR 680-13-02 do not apply to the following UST systems:

- Wastewater treatment tank systems;

- Any UST which contains radioactive material regulated under the Atomic Energy Act of 1954;
- UST systems that are part of an emergency generator system at a nuclear power generation facility regulated by the Nuclear Regulatory Commission under 10 CFR Part 50;
- Airport hydrant fuel distribution systems; and
- UST systems with field-constructed tanks.

These tanks must, however, comply with interim prohibitions for deferred UST systems [VR 680-13-02(§1.3)] and release response and corrective action requirements [VR 680-13-02 (Part VI)].

2.4.2 Part IV of VR 680-13-02, Release Detection, does not apply to any UST system that stores fuel solely for use by emergency power generators [VR 680-13-02(§1.2.D)].

2.5 REGULATORY DEADLINES AND PERFORMANCE STANDARDS FOR NEW AND EXISTING USTS

2.5.1 General

All new UST systems must be installed in compliance with VR 680-13-02(§2.1), Performance Standards for New UST Systems. Additionally, per VR 680-13-02(§2.2.A), all existing UST systems must comply with one of the following standards not later than December 22, 1998:

- New UST system performance standards under VR 680-13-02(§2.1)
- UST system upgrading requirements under VR 680-13-02(§2.2.B through E)
- Closure requirements as provided in VR 680-13-02(Part VII), including applicable requirements for corrective action under VR 680-13-02(Part VI)

2.5.2 Corrosion Protection

2.5.2.1 Under VR 680-13-02(§2.1) requirements for corrosion control, **new UST systems** may be constructed of fiberglass-reinforced plastic (FRP) or, if steel-constructed, tanks and piping may be cathodically protected as follows:

- The tank and piping are coated with suitable dielectric material;
- Field-installed cathodic protection of the UST and piping are designed by a corrosion expert; **AND**
- Cathodic protection systems are designed, operated, and maintained in accordance with VR 680-13-02(§3.2).

2.5.2.2 Existing UST systems may be upgraded to comply with corrosion control requirements by one of the following methods:

- As defined for new USTs under VR 680-13-02(§2.1).
- An interior lining installed in compliance with VR 680-13-02(§3.4), **AND** internally inspected within ten years of installation and every five years thereafter to ensure that the tank and lining are structurally sound and performing in accordance with original design specifications.
- Cathodic protection installed in compliance with VR 680-13-02(§2.1.A.2), **AND** tank integrity testing by:
 - Prior internal inspection;
 - Monthly monitoring in accordance with VR 680-13-02(§4.4.D through H) (for tanks that have been installed for less than 10 years);
 - Two tightness tests conducted in accordance with VR 680-13-02(§4.4.C); the first to be conducted prior to installing the cathodic protection system, the second to be conducted between three and six months after installing the system (for tanks that have been installed for less than 10 years); **OR**

- A method of assessment for corrosion holes that is determined by the Virginia DEQ to prevent releases in a manner that is no less protective of human health and the environment than the above methods.
- An internal lining installed in accordance with VR 680-13-02(§3.4) **AND** cathodic protection installed in accordance with VR 680-13-02(§2.1.A.2).

Existing metal piping must be upgraded to comply with corrosion protection in accordance with a recognized code of practice and must meet the requirements of VR 680-13-02(§2.1.B.2) for new UST systems.

2.5.3 Overfill/Spill Protection

2.5.3.1 Upon installation, **all new UST systems** must include spill/overfill protection as follows [VR 680-13-02(§2.1.C)]:

- Spill prevention equipment that will prevent release of product to the environment when the transfer hose is detached from the fill pipe (i.e. a spill catchment basin);
- Overfill prevention equipment that will either:
 - Automatically shut off flow into the tank when not more than 95% full, or
 - Alert the transfer operator when the tank is not more than 90% full by physically restricting product flow or by triggering a high-level alarm.

2.5.3.2 Not later than December 22, 1998, **existing UST systems** must be upgraded to comply with new UST system spill/overfill protection requirements as specified in VR 680-13-02(§2.1).

2.6 LEAK DETECTION

2.6.1 General

The "phase-in" system of deadlines for leak detection requirements for existing USTs has expired. **ALL new and existing UST systems, regardless of installation date, are**

required to employ leak detection methods in accordance with VR 680-13-02 (Part IV).

Leak detection methods must:

- Be capable of detecting a release from any portion of the tank and connected underground piping that routinely contains product;
- Be installed, calibrated, operated, and maintained in accordance with the manufacturer's instruction;
- Meet performance requirements detailed in VR 680-13-02(§4.4 and 4.5). Additionally, all method performance claims and their manner of determination must be described in writing by the manufacturer or installer; and
- Except for leak detection methods permanently installed before December 22, 1990, leak detection methods must be capable of detecting the leak rate or quantity specified for that method with a probability of 0.95 and a probability of false alarm of not more than 0.05.

2.6.2 Requirements for Petroleum UST Systems

2.6.2.1 **Tanks** must be monitored at least every 30 days for releases using one of the methods listed in VR 680-13-02(§4.4.D through H), except that:

- UST systems that meet performance standards in VR 680-13-02(§2.1.A through E) or VR 680-13-02(§2.2.A through D) may use monthly inventory control VR 680-13-02(§4.4.A or B) **and** tank tightness testing VR 680-13-02(§4.4.C) **every 5 years** until December 22, 1998, or until 10 years after the tank is installed/upgraded, whichever is later; and
- UST systems that do not meet performance standards in VR 680-13-02(§2.1.A through E) or VR 680-13-02(§2.2.A through D) may use monthly inventory control VR 680-13-02(§4.4.A or B) **AND** tank tightness testing VR 680-13-02(§4.4.C) **every year** until December 22, 1998, at which time the system must be upgraded in accordance with VR 680-13-02(§2.2) or permanently closed in accordance with VR 680-13-02(§7.2).

2.6.2.2 **Underground piping** that routinely contains a regulated substance must be monitored for releases as follows:

- **Pressurized piping** must be equipped with an automatic line leak detector which meets the requirements of VR 680-13-02(§4.5.1) **and** be subject to an annual line tightness test per VR 680-13-02(§4.5.2) or monthly monitoring per VR 680-13-02(§4.5.3).
- **Suction piping** must be subject to a line tightness test every three years per VR 680-13-02(§4.5.2) or a monthly monitoring method conducted in accordance with VR 680-13-02(§4.5.3); **however**, no release detection is required for suction piping that is designed and constructed in accordance with each of the following standards:
 - Below-grade piping operates at less than atmospheric pressure.
 - Below-grade piping is sloped so that the contents of the pipe will drain back into the storage tank if suction is released.
 - Only one check valve is included in each suction line.
 - The check valve is located directly below and as close as possible to the suction pump.
 - A method is provided that allows compliance with the above standards to be readily determined.

The "phase-in" system of deadlines for leak detection for pressurized and suction piping, regardless of the tank installation date, has expired.

2.6.3 Methods of Release Detection for Tanks [VR 680-13-02(§4.4)]

The following leak detection methods may be employed to meet the requirements of VR 680-13-02(§4.2) (Note: Please refer to VR 680-13-02(§4.4) for method-specific performance criteria.):

- Monthly inventory control (in conjunction with tank tightness testing)

- Manual tank gauging (may be used as sole method for tanks of 550 gallons or less nominal capacity, or in conjunction with tank tightness testing for tanks of 551 to 2,000 gallons nominal capacity)
- Tank tightness testing (in conjunction with one of the above methods of monthly monitoring)
- Automatic tank gauging (in conjunction with one of the above methods of monthly monitoring)
- Vapor monitoring
- Groundwater monitoring
- Interstitial monitoring (between system and secondary containment barrier)
- Other methods as provided in VR 680-13-02(§4.4.H).

2.6.4 Methods of Release Detection for Piping [VR 680-13-02(§4.5)]

The following leak detection methods may be employed to meet the requirements of VR 680-13-02(§4.2) (Note: Please refer to VR 680-13-02(§4.5) for method-specific performance criteria.):

- Automatic line leak detectors
- Line tightness testing
- Applicable tank methods.

2.7 VIRGINIA DEQ REPORTING AND RECORDKEEPING REQUIREMENTS

Owners and operators of UST systems must cooperate fully with inspections, monitoring, and testing conducted by the DEQ, as well as with requests for the submission of documentation as detailed in VR 680-13-02(§3.5).

2.7.1 Notification for Underground Storage Tanks

DEQ Form 7530, must be submitted within 30 days of UST system installation, or within 30 days of any change in ownership, tank status (e.g. temporary/permanent closure), tank/piping

systems (e.g., upgrades), or substance stored. Additionally, for new USTs, certification of compliance with VR 680-13-02(§2.1.D), Installation, must be submitted with Form 7530 in accordance with VR 680-13-02(§2.1.E), Certification of Installation [VR 680-13-02(§3.5.A.1,4)].

2.7.2 Releases

All releases must be reported as follows [VR 680-13-02(§3.5.A.2)]:

2.7.2.1 **Suspected Releases** must be reported within 24 hours if any of the following conditions are observed [VR 680-13-02(§5.1)]:

- Presence of released regulated substance at the UST site or in the surrounding area (e.g. free product, vapors).
- Unusual operating conditions (e.g. erratic behavior of dispensing equipment, sudden loss of product from system, unexplained water in tank) unless system equipment is found to be defective but not leaking, and is immediately repaired or replaced.
- Monitoring results from a release detection method indicate that a leak may have occurred unless sufficient data exists to refute the monitoring results.

2.7.2.2 **Spills/Overfills** must be immediately contained and cleaned up by the owner/ operator. Petroleum releases that are in excess of 25 gallons or that cause a sheen on nearby surface waters, or hazardous material releases in excess of the reportable quantity under CERCLA (40 CFR §302), and **any** releases that can not be cleaned up within 24 hours (regardless of quantity) must be reported to the DEQ within 24 hours [VR 680-13-02(§5.4)].

2.7.2.3 Upon determination of a **confirmed release** in accordance with VR 680-13-02(§5.3), or after a release from a UST system is confirmed in any other manner, owner/operator must notify the DEQ within 24 hours. Additionally, immediate action must be undertaken to prevent any further release of the regulated substance to the environment and to identify and mitigate any fire, vapor, and explosion hazards [VR 680-13-02(§6.2)].

2.7.3 Corrective Actions

Corrective actions planned or undertaken must be reported as follows [VR 680-13-02(§3.5.A.3)]:

- Initial abatement measures in accordance with VR 680-13-02(§6.3)
- Site characterization in accordance with VR 680-13-02(§6.4)
- Free product removal in accordance with VR 680-13-02(§6.5)
- Corrective action plan in accordance with VR 680-13-02(§6.6).

2.7.4 Records

The following **records** must be maintained and made immediately available to the DEQ at their request [VR 680-13-02(§3.5.B and C)]:

- Documentation of corrosion protection equipment operation in accordance with VR 680-13-02(§3.2)
- Documentation of UST system repairs or alterations in accordance with VR 680-13-02(§3.4)
- Recent compliance with release detection requirements in accordance with VR 680-13-02(§4.6)
- Results of site investigations conducted in conjunction with permanent closure in accordance with VR 680-13-02(§7.5).

2.8 PERMITS

In the case of Federal facilities such as NAVPHIBASE LCREEK, the Virginia Uniform Statewide Building Code (USBC) is enforced by the activity, who define the required permits and inspections for UST installation [VR 680-13-02(§2.1)] (a Certificate of Use is also required), UST upgrades [VR 680-13-02(§2.2)], and UST closure [VR 680-13-02(Part VII)]. A copy of the USBC is included in Appendix F.

In accordance with VR 680-13-02(§6.7), a permit issued by the DEQ is required for corrective action plans conducted in accordance with VR 680-13-02(§6.6).

2.9 UST CLOSURE REQUIREMENTS

2.9.1 General

Owners/operators must obtain a permit and the required inspections in accordance with the provisions of the USBC prior to any temporary or permanent UST closure.

2.9.2 Temporary Closure

2.9.2.1 When a UST system is temporarily closed, the operation of required corrosion protection in accordance with VR 680-13-02(§3.2) and leak detection in accordance with VR 680-13-02(Part IV) (unless the tank is empty as defined in VR 680-13-02(§7.1.A)) must be maintained [VR 680-13-02(§7.1.A)].

2.9.2.2 When a UST system is temporarily closed for three months or more, owners/ operators must, additionally, leave vent lines open and functioning, and cap and secure all other lines, pumps, manways, and ancillary equipment [VR 680-13-02(§7.1.B)].

2.9.2.3 When a UST system has been temporarily closed for twelve months, the system must be permanently closed in accordance with VR 680-13-02(§7.2 through §7.5) if it does not meet either the performance standards defined in VR 680-13-02(§2.1) for new UST systems or the upgrade standards defined in VR 680-13-02(§2.2), except that the spill/overflow requirements need not be met. Building officials may provide extensions to the 12-month provision; however, the owner/operator must complete a site assessment in accordance with VR 680-13-02(§7.3) before such an extension may be applied for.

2.9.3 Permanent Closure/Change in Service

2.9.3.1 Owner/operator must empty/clean the tank by removing all liquids and accumulated sludges in accordance with any applicable hazardous waste management regulations as provided by the Virginia DEQ, Waste Division.

2.9.3.2 All tanks permanently removed from service must be removed from the ground and disposed of in accordance with DEQ guidelines. Alternatively, Virginia DEQ may authorize closing of USTs by filling with inert solid material such as sand or concrete.

2.9.3.3 An assessment of the excavation zone as detailed in VR 680-13-02(§7.3) must be conducted prior to completing the permanent closure or change in service. Visibly impacted soil or groundwater, including the presence of free-phase product, is evidence of a release and **must** be reported to the DEQ within 24 hours in accordance with VR 680-13-02(§5.1).

2.9.3.4 Continued use of an UST system to store a non-regulated substance is considered a change in service. Before a change in service may be accomplished, the tank must be emptied/cleaned in accordance with VR 680-13-02(§7.2.C), and a site assessment conducted in accordance with VR 680-13-02(§7.3).

2.9.3.5 Owners/operators must maintain records in accordance with VR 680-13-02(§3.5) for a period of at least three years after the completion of permanent closure or change in service [VR 680-13-02(§7.5)].

2.9.4 An UST system closed prior to December 22, 1988, may be subject to site assessment requirements in accordance with VR 680-13-02(§7.3) if the UST may, in the judgement of the DEQ, pose a current or potential threat to human health and the environment [VR 680-13-02(§7.4)].

3.0 SITE-SPECIFIC INFORMATION

3.1 SITE CHARACTERISTICS

The mission of NAVPHIBASE LCREEK is to provide on-base logistics facilities and support services to local commands, organizations, other U.S. and allied units, home-ported ships, and commands of the operating forces to meet the amphibious training requirements of the Armed Forces of the United States.

3.1.1 Site Description

NAVPHIBASE LCREEK is a 2,147 acre installation located in the City of Virginia Beach in the Tidewater region of southeastern Virginia. The Chesapeake Bay borders the facility to the north, Shore Drive to the south, Bradford Lake to the east and Ocean View subdivision to the west.

The area is low-lying with elevations ranging from 0 to 13 feet above mean sea level. There are several small unnamed ponds on the installation, as well as, Desert Cove, Little Creek Cove and portions of Chubb Lake, Bradford Lake and Little Creek.

3.1.2 Climate

Average daily temperatures in the area range from approximately 41°F in January to 78°F in July, with an overall annual average of approximately 60°F. Average total annual precipitation is approximately 45 inches and is well-distributed throughout the year. The heaviest concentration of rainfall occurs in July (5.56 inches); approximately 34 percent (15.14 inches) of the annual total occurs in the summer months (July through September) (SCS, 1985).

3.1.3 Geology

The subject site is located within the Atlantic Coastal Plain Physiographic Province of Virginia. The coastal plain is an eastern thickening wedge of unconsolidated gravel, sand and clay sediments that attains a thickness of over 3,000 feet in the study area. These sediments overlie a bedrock basement of mostly Precambrian Age.

According to published geologic maps (Mixon et al., 1989), the subject site is underlain by two surficial geologic map units: the Holocene Age Coastal Barrier Sand Unit (Qs), and the

Lynnhaven Member of the upper Pleistocene Age Tabb Formation (Qtl). The Sand Unit is described as a pale-gray to light-yellowish gray, fine to coarse, shelly sand. The unit which is up to 40 feet thick, consists of coastal barrier island and narrow beach-dune ridges deposits along brackish-water marshes of Chesapeake Bay. The Lynnhaven Member deposits, which are up to 20 feet thick, are described as a pebbly and cobbly, fine to coarse sand grading upward into clayey and silty fine sand and sandy silt. The Lynnhaven Member consists of coast-parallel plain deposits in lowlands bounded on the landward side by bay facing scarps having an altitude of 15 to 18 feet mean sea level (msl). The unconsolidated deposits below the surficial geologic map units have been subdivided into four major geologic formations including from youngest to oldest: the Yorktown Formation (Pliocene), the Calvert Formation (Miocene), and the Potomac Formation (Cretaceous).

3.1.4 Soils

According to published soil maps (SCS, 1985), the subject site is underlain by three soil map units: the Newhan-Duckston-Corolla Association, the State-Tetotum-Augusta Association and the Udorthents-Urban Land Association. The Newhan-Duckston-Corolla Association, formed in marine and eolian sediments (Coastal Barrier Sand Unit), are nearly level to steep, very rapidly permeable soils on grass and shrub-covered sand dunes, flats and depressions along coastal areas of Chesapeake Bay. The soils of this association are excessively drained to poorly drained with a sandy substratum. The association has major limitations for development because of a seasonally high water table, very rapid permeability, slope and instability of sparsely vegetated areas. The State-Tetotum-Augusta Association, formed in marine and fluvial sediments (Lynnhaven Member deposits), are well drained, moderately well drained and somewhat poorly drained soils that have a loamy subsoil. The association consists of nearly level to gently sloping soils on broad ridges and side slopes. Development limitations of this association are mainly limited to a seasonally high water table. The Udorthents-Urban Land Association, formed in disturbed material of Lynnhaven Member deposits, are well drained or moderately well drained soils that have a loamy substratum and areas covered by buildings and roads.

3.1.5 Hydrogeology

The hydrogeologic framework for the study area is a series of aquifers and intervening confining units defined on the basis of lithologic and hydrologic properties of the coastal plain sediments. One water table and seven confined aquifers have been identified in the study area. The major flow boundaries of the system are the Fall line to the west, the freshwater-saltwater interface to the east and granitic basement rock.

The uppermost aquifer, the water table (also known as the Columbia aquifer), has formed in sandy surficial sediments and receives recharge from infiltrating surface water and precipitation. Generally, groundwater movement through the water table aquifer is lateral with flow patterns resembling a subdued reflection of the local topography. Local discharge of the water table aquifer occurs at surface water bodies. Locally, the water table is utilized as a water supply, but mainly for non-potable domestic purposes, because of its excessive iron content and susceptibility to contamination. Some groundwater also moves vertically from the water table to the underlying Yorktown confining unit. The confining unit is an aquitard and therefore, is capable of transmitting some water vertically to the underlying confined aquifers of the Yorktown Formation. Groundwater movement through the Yorktown confined aquifers is generally lateral, except at discharge zones along the Chesapeake Bay and Atlantic Ocean. The confined aquifers are widely used as both a domestic and public water supply in the region (Hamilton and Larson, 1988).

3.2 LIST OF REMOVED USTs

A list of the historical USTs at NAVPHIBASE LCREEK that have been removed or closed is provided as Table 3-1. The UST identification number, former contents, former capacity and the date the UST was removed from service is provided on the table. The most current status from removal to Corrective Action Planning is identified and the Virginia DEQ pollution case number (PC #) if a release was detected. The letter column identifies if a final closure letter has been received from the Virginia DEQ (marked with an "x") and the corresponding date or if NAVPHIBASE LCREEK has applied for closure (marked with a "1"). This table shall be updated as further information becomes available.

TABLE 3-1

**SUMMARY OF REMOVED UST SYSTEMS
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA**

UST ID #	Content	Capacity (gallons)	Date Removed	Status	DEQ Closure		
					PC #	Letter Rec'd	Date
1231-3	Waste Oil	550	12/01/90	Removed/Replaced w/AST	91-1759	X	8/16/94
1231-4	Waste Oil	550	12/01/90	Removed	91-1759	X	8/16/94
124	Waste Oil	550	1994	Removed/Replaced		(1)	
1265-1	Diesel	4,000	1994	Removed/Replaced		(1)	
1265-2	Waste Oil	1,000	1994	Removed/Replaced		(1)	
1265-3	Waste Oil	1,000	01/01/91	Removed/Replaced w/Oil/Water Separator	91-1759	X	8/16/94
1265-4	Waste Oil	1,000	01/01/91	Removed/Replaced w/Oil/Water Separator	91-1759	X	8/16/94
1516-3	Unleaded Gasoline	4,000	1994	Removed/Replaced	91-1087	X	8/18/94
1516-4	Unleaded Gasoline	4,000	1994	Removed/Replaced	91-1087	X	8/18/94
1518	Diesel	275	03/01/91	Removed/Replaced w/AST	NA	X	10/18/91
1610-5	Gasoline	6,000	05/01/90	CAP Submitted 04/10/92	90-1356	X	09/18/91
1610-6	Gasoline	6,000	05/01/90	CAP Submitted 04/10/92	90-1356	X	09/18/91
1612-16	Gasoline	10,275	11/16/92	Removed/Replaced	90-1356	X	08/17/94
1612-17	Gasoline	10,275	11/16/92	Removed/Replaced	90-1356	X	08/17/94
1612-18	Gasoline	10,275	11/16/92	Removed/Replaced	90-1356	X	08/17/94
1618	Diesel	4,000	1994	Removed/Replaced		(1)	
2012	Diesel	4,000	1994	Removed	NA	X	09/20/94
208	Waste Oil	550	1994			(1)	
2115	Diesel	275	03/01/91	Removed/Replaced w/AST	91-1754	X	08/16/94
214-2	Waste Oil	550	1994			(1)	
300-1	Gasoline	Unknown	03/01/88	Closed		(1)	
300-2	Gasoline	Unknown	03/01/88	Closed		(1)	
301-1 or (304-1)	Diesel	6,000	1994	Removed/Replaced	NA	X	09/20/94
301-2 or (304-2)	Unleaded Gasoline	6,000	1994	Removed/Replaced	NA	X	09/20/94
301-3	Waste Oil	2,000	1994	Removed/Replaced	NA	X	09/20/94
301-4	Waste Oil	550	1994	Removed/Replaced	NA	X	09/20/94
3033	Waste Oil	550	07/01/88	Removed/Bldg. Demo '87		(1)	
3108-5	Waste Oil	550	12/01/90	Removed/Replaced w/AST		X	10/18/91
3128-7	Gasoline	4,000	07/24/90	Permanently Closed		(1)	
3128-8	Gasoline	4,000	07/24/90	Permanently Closed		(1)	
3128-23	Gasoline	6,000	05/01/90	Permanently Closed		(1)	

TABLE 3-1 (Cont'd)

UST ID #	Content	Capacity (gallons)	Date Removed	Status	DEQ Closure		
					PC #	Letter Rec'd	Date
3142-1	Waste Oil	550	02/01/91	Removed/Replaced w/AST	91-1750	X	08/16/94
315CB	Waste Oil	550	12/01/91	Removed/Not Replaced	91-1760	X	08/16/94
317CB	Waste Oil	1,000	1994	Removed/Replaced		(1)	
3319-1	Gasoline	Unknown	05/01/90	Removed		(1)	
3319-2	Diesel	Unknown	05/01/90	Removed		(1)	
3319-19	Waste Oil	1,000	05/01/90	Removed		(1)	
3329-1	Waste Oil	550	12/31/91	Removed	92-1168	X	12/23/91
3329-2	Waste Oil	100	12/31/91	Removed	92-1168	X	12/23/91
3404-1	Gasoline	5,500	05/01/90	CAP Submitted 04/10/92	90-1667	X	09/18/91
3404-2	Diesel	5,500	05/01/90	CAP Submitted 04/10/92	90-1667	X	09/18/91
3505	Diesel	280	1994	Removed/Replaced	NA	X	09/09/94
3510	ND	ND	ND	Removed		(1)	
3511	Unknown	1,000	05/05/89	Removed		(1)	
3530-6	Waste Oil	500	07/24/90	Permanently Closed		X	
3530-7	Waste Oil	550	03/01/91	Removed/Not Replaced		(1)	
3530-8	Waste Oil	550	12/01/90	Closed/Replaced w/AST		(1)	
3615-9	Gasoline	10,000	12/90	Removed/Not Replaced	90-1086	X	08/17/94
3615-10	Gasoline	10,000	03/01/91	Removed/Not Replaced	90-1086	X	08/17/94
3615-11	Gasoline	10,000	03/01/91	Removed/Not Replaced	90-1086	X	08/17/94
3615-12	Gasoline	10,000	03/01/91	Removed/Not Replaced	90-1086	X	08/17/94
3615-13	Gasoline	10,000	03/01/91	Removed/Not Replaced	90-1086	X	08/17/94
3615-14	Diesel	4,000	03/01/91	Removed/Not Replaced	90-1086	X	08/17/94
3615-20	Waste Oil	550	10/31/89	Removed/Not Replaced		X	08/17/94
3661	Waste Oil	550	10/06/89	Removed/Closed		(1)	
3699-1	Diesel	500	06/01/91	Removed/Replaced w/AST	91-1752	X	08/16/94
3699-2	Gasoline	500	06/01/91	Removed/Replaced w/AST	91-1752	X	08/16/94
3801	Fuel Oil	2,000	5/90	Closed		(1)	
3806	Solvents	200	12/01/90	Removed/Not Replaced		X	10/18/91
3813	Naphtha Solvent	200	03/01/91	Removed/Replaced w/AST	91-1751	X	8/16/94
3817-1	Waste Oil	550	01/01/92	Removed: MCON P-337		(1)	
3817-2	Waste Oil	550	01/01/92	Removed: MCON P-337		(1)	
3823	Diesel	2,000	1994	Removed	NA	X	09/09/94
3827	Waste Oil	550	1994	Removed	NA	X	09/29/94
3860-1	Waste Fuel/Oil	10,000	10/15/92	Removed/Replaced w/UST		(1)	

TABLE 3-1 (Cont'd)

UST ID #	Content	Capacity (gallons)	Date Removed	Status	DEQ Closure		
					PC #	Letter Rec'd	Date
3860-2	Diesel/ Water	500	10/89	Removed/Closed		(1)	
3870-1	Diesel	5,000	03/01/91	Removed/Replaced w/AST	91-1753	X	08/16/94
3870-2	Water	5,000	1994			(1)	
3872-3	Diesel	500	03/01/91	Removed/Replaced w/AST		X	10/18/91
3872-4	Waste Oil	500	1994	Removed/Replaced		(1)	
3879	Diesel	550	03/01/89	Waiting for CAP Approval	90-1743	X	08/12/94
751	Diesel	55	01/01/92	Removed		(1)	
757	ND	ND	ND	Removed		(1)	
757C	Brine	5,000	01/01/89	Removed		(1)	
DCOVE-1	ND	ND	1989			(1)	
DCOVE-2	ND	ND	1989			(1)	
NIDER-1	Gasoline	10,000	12/01/91	CAP Amendment pending	90-1355	X	08/22/94
NIDER-2	Gasoline	10,000	12/01/91	CAP Amendment pending	90-1355	(1)	08/22/94
NIDER-3	Gasoline	10,000	12/01/91	CAP Amendment pending	90-1355	(1)	08/22/94
NIDER-4	Diesel	2,000	12/01/91	CAP Amendment pending	90-1355	(1)	08/22/94
NIDER-21	Gasoline	10,000	12/01/91	CAP Amendment pending	90-1355	(1)	08/22/94
NIDER-22	Gasoline	10,000	12/01/91	CAP Amendment pending	90-1355	(1)	08/22/94
NMCR (Bldg. 1) Tank No. 2	Diesel	660	5/90	Removed		(1)	
T-9	Waste Oil	550	01/01/91	Removed/Not Replaced	91-1755	X	08/16/94

(1) NAB Little Creek applied for permanent closure with the DEQ. Permanent closure approval pending.

ND = Not Determined.

3.3 LIST OF TANK ID # CHANGES

Through the evolution of UST management and preparation of compliance documents, the USTs at NAVPHIBASE LCREEK have been referenced by various names. Table 3-2 is intended to provide a cross-reference between historical ID numbers and the current UST ID number utilized in the USTMP.

In addition, previous documents have referred to P337 and 3896 as UST; they are actually oil-water (OW) separators not regulated under 40 CFR 280 or VR 680-13-02 and are, therefore, not included in this document.

TABLE 3-2

**TANK ID NUMBER CLARIFICATION
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA**

Current Tank ID Number	Previous Tank ID Numbers from the Following Sources:				Replaced Tank ID Number
	SPCC Plan	State Registration Form	Tank Status Report Base Engineering	UST Management Plan (Baker Environmental)	
1265-94-1					1265-1
1265-94-2					1265-2
1516-94-3					1516-3
1516-94-4					1516-4
1551					None
1556-1	1556	1586			None
1558-94-1					SURTASS-1 ¹
1558-94-2					SURTASS-2
1558-94-3					SURTASS-3
1612-19					1612-16
1612-20					1612-17
1612-21					1612-18
1618-94-1					1618-1
3505-94-1					3505-1
3827-94-1					3827-2
3868-3	3860		3860-3	3860-3	3860-3
3872-94-1	3872-94-4				3872-4
757-94-1	NAB757-94-1				757
CB124-94-1		124-94-1			CB124
CB301-94-3		301-94-3	301-94-3		301-3
CB301-94-4		301-94-4	301-94-4		301-4
CB304-94-1		304-94-1	304-94-1		304-1
CB304-94-2		304-94-2	304-94-2		304-2
CB317-94-1			317-94-1		CB317
ECTGO-1				E. Citgo-1	None
ECTGO-2				E. Citgo-2	None
ECTGO-3				E. Citgo-3	None
LSTP-12	LSTP12		LSTP11	LST Pier 11/12	None
LSTP-17	LSTP17		LSTP17	LST Pier 17	None
SURTASS-1					None
SURTASS-2					None
SURTASS-3					None

¹ = USTs SURTASS 1, 2, 3 are closed in place. USTs 1558-94-1, 2, 3 assume the function of SURTASS USTs, but were installed at a different location.

4.0 BASIS OF TECHNICAL RECOMMENDATIONS

In accordance with the objectives expressed by LANTDIV personnel, Dames & Moore has developed a USTMP that provides recommendations for a comprehensive management plan, rather than one that would merely achieve regulatory compliance. Accordingly, the scope of the plan includes all USTs known to exist at NAVPHIBASE LCREEK, regardless of their regulatory status, and provides a long-term plan for achieving the objectives, so that staffing requirements and capital expenditures could be reasonably allocated and controlled.

Although these recommendations necessarily address the issue of achieving regulatory compliance, Dames & Moore has placed the highest priority on protecting human health and the environment, and maintains that any significant risk thereto outweighs the risks and liabilities associated solely with the occurrence of a release or the failure to achieve regulatory compliance.

Dames & Moore has maintained the following guidelines in developing the recommendations provided herein:

- UST Notification Forms have been provided in Appendix G.
- Electrical release detection monitoring systems for tanks minimize the manpower demands; however, in order for these electrical monitoring systems to be properly operated, activity personnel must be properly trained with the operation and maintenance of this equipment, including regular inspection/testing. It is recommended that an operations & maintenance plan be developed.
- Steel piping associated with newly installed USTs must be equipped with cathodic protection or the piping must be replaced with nonmetallic piping. Because of the required cathodic protection testing, it is recommended that nonmetallic piping be installed, where possible, as opposed to retrofitting existing steel piping with cathodic protection.

- UST systems supplying fuel for emergency generators (USTs 3505-94-1 and 757-94-1) are currently deferred from the release detection requirements of the regulations. However, it is presumed that the Navy wishes to include all existing release detection provisions of the regulations as the basis to evaluate the long-term action for such UST systems. These two USTs are equipped with the capabilities of release detection but the monitoring system for UST 757-94-1 is not properly connected.
- Although the field-constructed tank (UST 1551) is currently exempt from leak detection requirements, Dames & Moore has recommended tightness testing every two years in order to provide the highest level of protection to human health and the environment. Recommendations for this tank should be reevaluated after Virginia DEQ completes regulations specific to field constructed tanks.
- Because of the physiochemical properties of gasoline, and its high concentrations of benzene (a known carcinogen), risks to human health and the environment are generally greater from a gasoline release than from a release of diesel fuel or heating oil. Therefore, priority is given to ensuring the integrity of gasoline storage tanks and achieving regulatory compliance of any such tanks. The physiochemical properties of all substances contained in NAVPHIBASE LCREEK USTs are detailed in manufacturers Material Safety Data Sheets (MSDSs), included as Appendix I.
- As previously stated, double-walled USTs provide the highest level of protection from potential releases. Dames & Moore suggests that the Navy's long-term interests will best be served by requiring that all new UST installations be of double-walled construction in order to provide maximum protection to human health and the environment and to limit liability from possible future releases. At this time, the majority of the USTs at NAVPHIBASE LCREEK are double-walled tanks.

5.0 GENERAL RECOMMENDATIONS

Activity management personnel and operational staff should maintain an appropriate level of understanding regarding UST management practices. Accordingly, Dames & Moore recommends the following training and operational guidelines.

5.1 PERSONNEL TRAINING

Personnel involved with USTs, from managers to operators and delivery personnel, require training to understand:

- Why regulations have been adopted.
- How compliance with regulations reduces releases.
- What role each individual is to play in reducing the likelihood of releases.

A comprehensive training program should be developed by each activity to ensure compliance with all operational and maintenance procedures required by the regulations. At the operating level, it is vital that all persons dealing with USTs clearly understand how they are to contribute to the elimination of releases and that they be trained in methods and procedures that enable them to fulfill these obligations. Updating tank facilities according to the regulations does not, by itself, provide fail-safe conditions for UST operations. For example, surface spills and overfills are usually the result of human error, not equipment failure. Delivery personnel must ensure that the volume available in each tank is greater than the volume of product to be transferred to the tank before the transfer is made and that the transfer operation is monitored constantly. Valid tank charts must be readily available to operations personnel in order to prevent overfills. If charts are not available, they can be developed.

Additionally, delivery and transfer equipment and procedures should be reviewed and a program developed, as required, to assure handling of petroleum in conformance with current industry standards.

5.2 PROCUREMENT OF TANK SERVICES

5.2.1 Tank Construction/Installation

It is anticipated that considerable tank construction activity will be undertaken in the next several years. Dames & Moore recommends that contractors be required to supply detailed documentation regarding installations and upgrading work. Prior to any construction work, contractors should be required to prepare the following submittals for Navy approval:

- Manufacturer's certified equipment drawings.
- Installation drawings showing tanks, pipe sizes, location, slopes, fittings, valves, meters, gauges and connections.
- Manufacturer's certification that equipment meets or exceeds specification requirements.
- Operation and maintenance manuals.
- Wiring schematics and interconnection diagrams.
- Power distribution.
- Manufacturer's literature containing equipment description, installation instructions, electrical ratings, wiring systems, etc.
- Schematics showing sensor locations, connections, operation and wiring.

Subsequent to actual installation, as-built drawings should be required to document the installation.

Copies of all above documentation should be maintained in the operations and environmental offices.

5.2.2 Tank Removal/Closure

For tank removal/closure activities, Dames & Moore recommends that, prior to start of work, the contractor submit data for approval showing that the tank removal Contractor, subcontractors, and personnel employed on the project have been engaged in removal,

transportation, and disposal of underground tanks and associated piping, are familiar with and shall abide with the following:

- a. API RP 1604.
- b. 40 CFR 280 and State and local regulations and procedures.
- c. Applicable safety rules and regulations.
- d. Use of equipment and procedures for testing and vapor-freeing tanks.
- e. Handling and disposal of types of wastes encountered in underground tank and pipe removal including disposal of underground tanks and associated piping.
- f. Excavation, testing, and disposal of petroleum contaminated soils, liquids, and sludge.
- g. Provide documentation that tank removers are certified if locality of project has this requirement.

In addition, the contractor should furnish data proving experience on at least three prior projects which included types of activities similar to those in this project. The contractor should provide project titles, dates of projects, owners of projects, point of contact for each project, and phone numbers of each point of contact.

At the conclusion of removal/closure activities, the contractor shall provide the Contracting Officer a Site Assessment Report in a single binder notebook which shall contain a collection of reports, records, starting and ending dates of reporting period, inspections, documentation, and data as follows:

- a. Complete UST Notification Form (within 30 days of closure).
- b. Description of work, including removal procedures, number of tanks removed, identification of tanks removed and disposed of, cubic yards of excavated soil, location of disposal sites, and dates of excavation.
- c. Site plan, including location of tanks and piping, limits of excavation, sampling points, results of excavation, and depths.

- d. Laboratory testing reports, copies of data and test results from testing laboratory.
- e. Tank disposal documentation, contaminated soil disposal documentation, and contaminated water disposal documentation.
- f. Certifications required by implementing agency.
- g. Building permit, inspection permits, and other permits required for underground tank removal, notifications, and inspection reports.
- h. Cumulative quantities of soil excavated, beginning with start date for each tank and associated piping.

5.3 OPERATION & MAINTENANCE PLAN

While the majority of NAVPHIBASE LCREEK USTs have been upgraded to include electronic leak detection, volume control, etc., these systems still require significant operation & maintenance (O&M). For instance, several of the systems were not operational due to water in the sumps, unplugged monitoring panels or alarms set on panels. An O&M plan should define the following for each tank system:

- Current Leak Detection Equipment
 - Manufacturer
 - O&M Support Information
 - Reprogramming information
 - Repair contact (name/phone no.)
- Inspection Requirements/Frequency
 - Leak detection control panels (LDCPs)
 - Sumps for water/product
 - Monitoring wells (product, vapor sensors)

- Maintenance
 - NAVPHIBASE LCREEK LDCP reprogrammer
 - Contractor reprogrammer
 - Monthly inventory report cataloguing.

The Plan should be laid out to provide regular maintenance, but reduce effort required by NAVPHIBASE LCREEK while ensuring compliance.

5.4 PUBLICATION LIBRARY

In addition to developing and maintaining a file on each UST system, Dames & Moore recommends that the Activity Environmental Officer secure and maintain a library of the UST-related publications identified below for convenient reference (May 1994 prices are indicated).

5.4.1 American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005, (202) 682-8190

- API 1604, "Removal and Disposal of Used Underground Petroleum Storage Tanks," Second Edition (1987, supplemented 3/89): \$18.00.
- API 1615, "Installation of Underground Petroleum Product Storage System," Fourth Edition (1987, supplemented 3/89): \$18.00.
- API 1621, "Recommended Practice for Bulk Liquid Stock Control at Retail Outlets," Fifth Edition (1993): \$25.00.
- API 1632, "Cathodic Protection of Underground Petroleum Storage Tanks and Piping Systems," Second Edition (1987): \$16.00.

5.4.2 Underwriters Laboratories, Inc., 333 Pfingsten Road, Northbrook, IL 60062, (708) 272-8800

- UL 58, "Standard for Steel Underground Tanks for Flammable and Combustible Liquids," Eighth Edition (1986): \$95.00.
- UL 567, "Pipe Connectors for Flammable and Combustible and LP Gas," Seventh Edition (1992): \$330.00.

- UL 971, "Proposed Standard for UL Listed Non-Metal Pipe," (1993): \$30.00
 - UL 1316, "Standard for Glass-Fiber-Reinforced Plastic Underground Storage Tanks for Petroleum Products," Second Edition (1994): \$95.00
 - UL 1746, "Corrosion Protection Systems for Underground Storage Tanks," Second Edition (1993): \$330.00.
- 5.4.3 Petroleum Equipment Institute, P. O. Box 2380, Tulsa, OK 74101, (918) 494-9696
- PEI RP100-94, "Recommended Practices for Installation of Underground Storage Systems," (Rev. 1994): \$15.00.
- 5.4.4 National Fire Protection Association, Batterymarch Park, Quincy, MA 02269, (800) 344-3555
- NFPA 30, "Flammable and Combustible Liquids Code," (1993): Codebook only, \$21.50; Handbook with Explicit Interpretation, \$64.75.
 - NFPA 30A, "Automotive and Marine Service Station Code," (1993): \$16.00.
 - NFPA 385, "Standard for Tank Vehicles for Flammable and Combustible Liquids," (1990): \$16.00.
- 5.4.5 American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103, (215) 299-5535
- ASTM DH021-92, "Standard Specification for Glass-Fiber-Reinforced Polyester Underground Petroleum Storage Tanks," (Rev. 1992): \$15.00.
- 5.4.6 Steel Tank Institute, 570 Oakwood Road, Lake Zurich, IL 60047, (708) 438-0989
- STI-P3-93 Specification, sti-P₃[®] Specification and Manual for External Corrosion Protection of Underground Steel Storage Tanks," (Rev. 1993): \$50.00.
- 5.4.7 National Association of Corrosion Engineers, P.E. Box 218340, Houston, TX 77218, (713) 492-0535 (X81)
- NACE RP-0285-85, "Control of External Corrosion on Metallic Buried, Partially Buried, or Submerged Liquid Storage Systems," (1985): \$24.00.

- NACE RP-0169-92, "Control of External Corrosion on Submerged Metallic Piping Systems," (Rev. 1992): \$24.00.

5.5 MISCELLANEOUS RECOMMENDATIONS

5.5.1 Manual Gauging

It is recommended all persons responsible for UST inventory control be instructed on the proper method to manually gauge ("stick") a tank. The gauging stick should NEVER be dropped into a tank, especially single-walled fiberglass tanks manufactured before 1989. Older fiberglass tanks may not have striker plates on the bottom of the tank and gauging stick impact has been proven to cause wall failure on such tanks as a result of puncture and cracking. For tanks equipped with automatic tank gauge, gauging is recommended in order to test the accuracy of the automatic tank gauge.

6.0 TECHNICAL RECOMMENDATIONS

6.1 INTRODUCTION

As stated in Section 4.0, Basis of Technical Recommendations, it is presumed that the Navy wishes to operate and maintain all USTs containing regulated substances in accordance with current UST technical regulations, regardless of regulatory status. Therefore, the proposed work schedule, as provided in Sections 6.2 and 6.3, makes little distinction among regulated, deferred or non-regulated USTs.

Tank-by-tank management recommendations are presented in Section 6.2. The proposed schedule, presented in Section 6.3, indicates that all work is to be accomplished by December 22, 1998, the final deadline for UST compliance in Virginia.

Information such as tank age, installation date, tank capacity, and tank contents was extracted from information provided by NAVPHIBASE LCREEK and LANTDIV. No information was provided by either source to suggest that tanks were not new at their time of installation; therefore, in cases when only tank age or installation was available, the installation date or age, respectively, was determined accordingly. In cases where conflicting information was provided, the most conservative information was used (e.g., older tank, larger capacity). Additionally, unless otherwise indicated, piping was assumed to be the same age as the tank.

Section 6.3 presents the budget and schedule and a summary of recommended tank actions. Costs presented in this section are detailed in Appendix H.

6.2 TANK-SPECIFIC TECHNICAL SUMMARIES/RECOMMENDATIONS

Tank-specific technical summaries and recommendations follow in tabular form.

6.3 PROPOSED ANNUAL WORK SCHEDULE AND ESTIMATED BUDGET

The proposed annual work schedule is presented in Table 6-1. The schedule has been prioritized to address out-of-compliance USTs in 1995 and the remaining USTs during the period from 1996 through 1998. The schedule can be expedited based on the availability of funds.

TABLE 6-1
SUMMARY OF ANNUAL WORK SCHEDULE/BUDGET COST
UNDERGROUND STORAGE TANK MANAGEMENT PLAN
NAVPHIBASE LCREEK
NORFOLK, VIRGINIA

Tank ID	Contents	Cap. (gal.)	Status	FY 1996	FY 1997
All	Various	NA	Active	Develop Operations & Maintenance Program \$12,000 Perform Warranty Work \$0	- - -
1551	Diesel	567,000	Active	- - -	Tightness Test System \$16,000 first test; \$6,000 each additional test
1586	Isopar	8,000	Active	- - -	Replace SW Steel Piping with DW Piping \$17,000
3868-3	Waste Oil	10,000	Active	- - -	Install DW Piping/Spill Containment and Canopy/Curbing \$95,000
3827-94-1	Waste Oil	500	Active	- - -	Install New Fill Cap \$100

UST ID No.: 1265-94-1

CONTENTS: Diesel

BUILDING No.: Bldg. 1265 (SIMA Shop)

CAPACITY (gal.): 4,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut-off (at 95% capacity)
Leak Detection: Automatic tank gauge, interstitial monitoring (brine)
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 3/4-inch copper supply and return lines within 3-inch FRP containment pipe
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe)

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells without monitoring probes. Monitoring wells in vicinity of UST.

USAGE: Supplies fuel to Diesel Engine Shop for testing engines

RECOMMENDATIONS:

The monitoring system console, which indicated a "Brinhi Ramco" alarm, should be inspected and repaired or reprogrammed by the contractor who installed the tank and monitoring system (system under warranty). If sump probe is the only method of interstitial monitoring for piping, it is recommended that the secondary containment for the piping not be sealed at the tank sump.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Repair or reprogram monitoring system. Remove plastic piece that is sealing secondary containment from discharging to sump (if that is the only interstitial monitoring method for the piping).Prepare and implement an O & M Plan for the USTs.	<p>N/A (under warranty)</p> <p>\$ 12,000 for all USTs</p>

UST ID No.: 1265-94-2

CONTENTS: Waste oil

BUILDING No.: Bldg. 1265 (SIMA Shop)

CAPACITY (gal.): 4,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch clean out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut-off (at 95% capacity)
Leak Detection: Automatic tank gauge, interstitial monitoring (brine)
Vapor Recovery System: None (NA)

PIPING INFORMATION:

Construction: Double-walled FRP¹
Delivery Type: Gravity
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring system¹
Monitoring System Console: INCON TS-1000

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells without monitoring probes. Monitoring wells in vicinity of UST.

USAGE: Collects waste oil from trench drain in Diesel Overhaul Area inside Bldg. 1265.

RECOMMENDATIONS:

The monitoring system console, which indicated a "Brinhi Ramco" alarm, should be inspected and repaired or reprogrammed by the contractor who installed the tank and monitoring system (system under warranty).

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Repair or reprogram monitoring system	N/A (under warranty)
	• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

¹ No visual inspection possible because there is no access to gravity drain line connection to tank. Information based on activity personnel and available documentation.

UST ID No.: 1516-94-3¹

CONTENTS: Unleaded gasoline

BUILDING No.: Marina (Bldg. 1516)

CAPACITY (gal.): 6,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP

Direct Tank Openings: 4-inch fill

Cathodic Protection: None (NA)

Spill Prevention: Catchment basin

Overfill Prevention: High level alarm (at 90% capacity) with automatic shut-off (at 95% capacity)

Leak Detection: Automatic tank gauge, interstitial monitoring (brine), manual tank gauging.

Vapor Recovery System: Stage I Vapor Recovery

Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment

Delivery Type: Pressurized¹

Cathodic Protection: None (NA)

Leak Detection: Interstitial monitoring¹

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells (without monitoring probes) surrounding USTs 1516-94-3 & 4.

USAGE: Fuel supply for Marina.

RECOMMENDATIONS:

Automatic tank gauge needs to be reprogrammed or repaired.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Reprogram or repair automatic tank gauge.	N/A (under warranty)
	• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

¹ No visual inspection possible. Information based on activity personnel and available documentation.

UST ID No.: 1516-94-4¹

CONTENTS: Diesel

BUILDING No.: Marina (Bldg. 1516)

CAPACITY (gal.): 6,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut-off (at 95% capacity)
Leak Detection: Automatic tank gauge, interstitial monitoring (brine), manual tank gauging
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment
Delivery Type: Pressurized¹
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring¹

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells (without monitoring probes) surrounding USTs 1516-94-3 & 4.

USAGE: Fuel supply for Marina

RECOMMENDATIONS:

Automatic tank gauge needs to be reprogrammed.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Reprogram or repair automatic tank gauge.	N/A (under warranty)
	• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

¹ No visual inspection possible. Information based on activity personnel and available documentation.

UST ID No.: 1551

CONTENTS: F-76 Diesel fuel

BUILDING No.: Main Diesel Tank

CAPACITY (gal.): 567,000

STATUS: Active

YEAR INSTALLED: 1951

TIGHTNESS TEST: July 1991 (Tracer)

UST INFORMATION:

Construction: 3/8-inch steel-lined concrete walls and floor with a concrete slab roof.

Direct Tank Openings: 4-inch opening in "dog house" and 48-inch manway.

Cathodic Protection: Cathodically protected but 1983 corrosion study identified protection to be inadequate.

Spill Prevention: Concrete containment curb at each vessel filling area with a drain that discharges to USTs LSTP-17 OR 12.

Overfill Prevention: Audible high-level alarm (at 95% capacity) and valve-shut mechanism (at 98% capacity).

Leak Detection: Tightness test in July 1991 (Tracer), automatic tank gauge added in 1990.

Vapor Recovery System: None (NA)

PIPING INFORMATION:

Construction: Single-walled steel installed in 1970's (currently being replaced with combination of single-walled steel aboveground piping and double-walled underground piping).

Delivery Type: Pressurized and suction

Cathodic Protection: Present

Leak Detection: Tightness tested in June 1993 (Tracer). Tightness test in March 1993 identified a leak in the return lines near UST PIER17; piping repaired and retested.

REGULATORY STATUS: Regulated but deferred from Parts II, III IV, V and VIII.

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Monitoring wells in vicinity

USAGE: Supplies fuel to vessels and tanker trucks

RECOMMENDATIONS:

Although tightness testing is not required for a field constructed UST, it is recommended that UST 1551 be tightness tested on a regular basis until field constructed tank regulations have been promulgated.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
	• Periodic Tightness Testing	\$ 16,000 first year \$ 6,000 each additional test
	• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

UST ID No.: 1586

CONTENTS: Isopar

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Active

YEAR INSTALLED: 1993

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP

Direct Tank Openings: 4-inch gauge pipe

Cathodic Protection: None (NA)

Spill Prevention: Catchment basin, 6-inch concrete curb surrounding concrete slab with a drain that discharges to an oil/water separator.

Overfill Prevention: Whistle vent alarm

Leak Detection: Interstitial monitoring, automatic tank gauging

Vapor Recovery System: None (NA)

Monitoring System Console: VEEDER ROOT TLS-250i

PIPING INFORMATION:

Construction: Single-walled steel piping

Delivery Type: Pressurized

Cathodic Protection: Four anode bags (sacrificial)

Leak Detection: None

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance. Automatic line leak detection is required to be installed on the pressurized supply line.

MONITORING WELLS PRESENT: Monitoring wells in the vicinity.

USAGE: Used with electronic equipment, modules.

RECOMMENDATIONS:

Automatic line leak detection must be installed on the pressurized supply lines. Cathodic protection on steel piping must be tested within 6 months of installation and at least every three years thereafter. Activity personnel indicated that the cathodic protection has been tested within six months of installation. Records of the results of the last two cathodic protection inspections must be maintained in order to demonstrate compliance with the performance standards. It is recommended that the underground piping be replaced with double-walled fiberglass piping with interstitial monitoring in order to fulfill the automatic line leak detection requirement and eliminated the requirement of testing the steel piping every three years.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Replace underground single-walled steel piping with double-walled FRP piping with interstitial monitoring. (Note: within the building, the piping will be aboveground single-walled piping).	\$ 17,000
	<ul style="list-style-type: none">Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

UST ID No.: 1558-94-1

CONTENTS: Norpar

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment underground/2" single-walled steel aboveground just before entering building and inside building.
Delivery Type: Pressurized
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells with no visible monitoring probes.

USAGE: Used with electronic equipment (modules) in Building 1558.

RECOMMENDATIONS:

The monitoring system console was turned off at the time of the site visit; the system indicated that there was a "float missing" in Tank 3 (UST 1558-94-3). Monitoring system should be repaired (under warranty).

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair monitoring system	NA (under warranty)
	<ul style="list-style-type: none">• Prepare and implement an O & M Plan for the USTs	See 1265-94-1

UST ID No.: 1558-94-2

CONTENTS: Norpar 12

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm
Leak Detection: Interstitial monitoring system (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment underground/2" single-walled steel aboveground
just before entering building and inside building.
Delivery Type: Pressurized
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In Compliance

MONITORING WELLS PRESENT: Four observation wells with no visible monitoring probes.

USAGE: Used with electronic equipment modules in Building 1558.

RECOMMENDATIONS:

The monitoring system console was turned off at the time of the site visit; the system indicated that there was a "float missing" in Tank 3 (UST 1558-94-3). Monitoring system should be repaired (under warranty).

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair monitoring system• Prepare and implement an O & M Plan for the USTs	<p>NA (under warranty)</p> <p>See 1265-94-1</p>

UST ID No.: 1558-94-3

CONTENTS: Waste oil (waste Norpar/Isopar)

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP

Direct Tank Openings: 4-inch clean-out port

Cathodic Protection: None (NA)

Spill Prevention: Catchment basin

Overfill Prevention: High level alarm

Leak Detection: Automatic tank gauging. Interstitial monitoring probe present but not connected.

Vapor Recovery System: None (NA)

Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP underground/2" single-wall steel aboveground

Delivery Type: Pressurized/gravity

Cathodic Protection: None (NA)

Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance (no automatic line leak detection for pressurized piping because secondary containment sealed from probe).

MONITORING WELLS PRESENT: Four observation wells with no visible monitoring probes.

USAGE: NORPAR waste is stored in this tank from building 1558.

RECOMMENDATIONS:

The interstitial monitoring probe was not properly installed (no electrical connection) and should be properly connected. The monitoring system console was turned off at the time of the site visit; the system indicated that there was a "float missing" in Tank 3 (UST 1558-94-3). Monitoring system should be repaired (under warranty). Secondary containment for piping was sealed and would, therefore, restrict leaked product from discharging into sump to be detected by sump probe if a leak occurred. The plastic piece sealing the secondary containment should be removed if there is no additional probe within this containment pipe.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Properly connect the interstitial probe. Repair monitoring system. Remove plastic piece that is sealing the secondary containment pipe from the sump.	N/A (under warranty)
	<ul style="list-style-type: none">Prepare and implement O & M Plan for the USTs.	See 1265-94-1

UST ID No.: 1612-19

CONTENTS: Premium unleaded gasoline

BUILDING No.: 1612 (Citgo, Gate 1)

CAPACITY (gal.): 10,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: Ball-float in vent
Leak Detection: Interstitial monitoring
Vapor Recovery System: Stage I - 2 point system
Monitoring System Console: VEEDER ROOT ILS-250

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Pressurized
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells with no visible probes and four monitoring wells in the vicinity. Appear to be filled (gravel or oversaturated bentonite).

USAGE: Vehicle fueling

RECOMMENDATIONS:

No recommendations.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
	<ul style="list-style-type: none">• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

UST ID No.: 1612-20

CONTENTS: Mid-grade unleaded gasoline

BUILDING No.: 1612 (Citgo, Gate 1)

CAPACITY (gal.): 10,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: Ball float in vent
Leak Detection: Interstitial monitoring
Vapor Recovery System: Stage I - 2 point system
Monitoring System Console: VEEDER ROOT ILS-250

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Pressurized
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells with no visible probes and four monitoring wells in the vicinity. Appear to be filled (gravel or oversaturated bentonite).

USAGE: Vehicle fueling

RECOMMENDATIONS:

No recommendations.

YEAR

ACTION

CONSTRUCTION
BUDGET

- Prepare and implement an O & M Plan for the USTs.

See 1265-94-1

UST ID No.: 1612-21

CONTENTS: Regular unleaded gasoline

BUILDING No.: 1612 (Citgo, Gate 1)

CAPACITY (gal.): 10,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: Ball float in vent
Leak Detection: Interstitial monitoring
Vapor Recovery System: Stage I - 2 point system
Monitoring System Console: VEEDER ROOT ILS-250

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Pressurized
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In Compliance

MONITORING WELLS PRESENT: Four observation wells with no visible probes and four monitoring wells in the vicinity. Appear to be filled (gravel or oversaturated bentonite).

USAGE: Vehicle fueling

RECOMMENDATIONS:

No recommendations.

YEAR

ACTION

CONSTRUCTION
BUDGET

- Prepare and implement an O & M Plan for the USTs.

See 1265-94-1

UST ID No.: 1618-94-1

CONTENTS: Diesel

BUILDING No.: 1618 (EOD AREA)

CAPACITY (gal.): 4,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm with 95% full automatic shut off
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/2-P

PIPING INFORMATION:

Construction: Double-walled FRP¹
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells (no monitoring probes installed)

USAGE: Supplies fuel for vehicles

RECOMMENDATIONS:

According to activity personnel, the monitoring system reports "low brine" approximately once a week. Interstitial monitoring system needs to be repaired.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Repair interstitial monitoring system.	NA (under warranty)
	• Prepare and implement an O & M Plan for the USTs.	See 1265-94-1

¹ According to plans, the piping was constructed of double-walled FRP. However, it was not visually evident that the piping was double-walled.

UST ID No.: 3505-94-1

CONTENTS: Diesel

BUILDING No.: 3505 (Hospital)

CAPACITY (gal.): 600

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: Unknown
Leak Detection: Interstitial monitoring (brine), automatic tank gauging
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: 1/2" copper supply and return lines within 3" FRP containment
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated but deferred from leak detection

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells (no monitoring probes installed)

USAGE: Supplies fuel to emergency generator.

RECOMMENDATIONS:

No recommendations.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Prepare and implement O & M Plan for the USTs.	See 1265-94-1

UST ID No.: 3827-94-1

CONTENTS: Waste oil

BUILDING No.: 3827 (ACU-4 Wash Rack)

CAPACITY (gal.): 600

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: No high level alarm visible
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Gravity drain
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells. One monitoring well near UST.

USAGE: Contains oil from oil/water separator process at wash rack.

RECOMMENDATIONS:

Install cap on fill port. According to activity personnel, the monitoring system is not operating properly. Details not available. Appeared to be properly functioning at time of site visit.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Install cap on fill port.	\$100
	<ul style="list-style-type: none">• Evaluate operational difficulties associated with monitoring system.	N/A (under warranty)

UST ID No.: 3827-2

CONTENTS: Sand/concrete (formerly waste oil)

BUILDING No.: 3827 (ACU-4 Wash Rack)

CAPACITY (gal.): 550

STATUS: Closed-in-place

YEAR INSTALLED: 1986

TIGHTNESS TEST: N/A

UST INFORMATION:

Construction: Single-walled bare steel
Direct Tank Openings: None
Cathodic Protection: None
Spill Prevention: None
Overfill Prevention: None
Leak Detection: None
Vapor Recovery System: None
Monitoring System Console: None

PIPING INFORMATION:

Construction: Single-walled unprotected metal
Delivery Type: Gravity drain
Cathodic Protection: None
Leak Detection: None

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance.

MONITORING WELLS PRESENT: One monitoring well in vicinity of UST.

USAGE: Closed-in-place.

RECOMMENDATIONS:

The activity should notify Virginia DEQ that this UST has been closed in place.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Notify DEQ	N/A

UST ID No.: 3868-3

CONTENTS: Waste oil

BUILDING No.: 3860 (DC Fuel Farm)

CAPACITY (gal.): 10,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double Walled FRP
Direct Tank Openings: 6-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: None
Overfill Prevention: Ball float valve in vent
Leak Detection: Interstitial monitoring (brine)
Vapor Recovery System: None (NA)
Monitoring System Console: VEEDER ROOT ILS-250 (in Bldg. 3860)

PIPING INFORMATION:

Construction: Single-walled cast iron
Delivery Type: Gravity drain
Cathodic Protection: None
Leak Detection: None

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance (require cathodic protection of piping).

MONITORING WELLS PRESENT: Four observation wells with no monitoring probes. Monitoring wells in the vicinity of UST.

USAGE: Contains diesel from fueling procedures at fuel pits and truck transfer station.

RECOMMENDATIONS:

Spill protection should be installed on the clean out port. Replace steel piping with double-walled non-metallic piping prior to December 1998 (or install cathodic protection on piping). According to activity personnel, rain water also collects in the tank and when the tank is full, waste oil and water backs up into the fuel pits and drain in the truck loading area. Check valves should be installed on both the inlets and outlets of the piping to prevent backflow into the fuel pits and truck loading area drain. In addition, a concrete curb should be constructed around the truck loading area and the size of roof covering the truck loading area should be increased to cover the containment area.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Install spill protection• Replace steel piping with double-walled non-metallic piping• Construct a concrete curb surrounding the truck loading area and construct a larger-sized roof• Prepare and implement an O & M Plan for the USTs	<p>\$ 95,000</p> <p>See 1265-94-1</p>

UST ID No.: 3872-94-1¹

CONTENTS: Waste oil (waste F-76 diesel, lubricating oil)

BUILDING No.: 3872 (Applied Instructors Building)

CAPACITY (gal.): 500

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 5 1/2-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin, 7" containment curb surrounding concrete slab
Overfill Prevention: Overfill alarm (at 95% capacity)
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/2-P

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment¹
Delivery Type: Gravity drain
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring¹

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance (leak detection system turned off).

MONITORING WELLS PRESENT: Two observation wells (no monitoring probes installed).

USAGE: Contains waste oil (waste F-76 diesel and lubricating oils) from Applied Instructors lab.

RECOMMENDATIONS:

At the time of the site visit, the monitoring system console was turned off because the system was not working properly. System indicated low brine. Reported problem of water leakage into manholes. If there is a sump probe in the sump with the gravity drain piping connection to the tank, the probe should be tested since it has likely been submerged in water for an extended period of time.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair or reprogram monitoring system• Test sump probe• Prepare and implement an O & M Plan for the USTs	N/A (under warranty) See 1265-94-1

¹ No visual inspection possible. Information based on activity personnel.

UST ID No.: 757-94-1

CONTENTS: Diesel

BUILDING No.: 757 (Steam Plant)

CAPACITY (gal.): 4,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut off (at 95% capacity).
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: ICON TS-1000

PIPING INFORMATION:

Construction: 1/2-inch copper fuel oil supply and 3/4-inch copper fuel oil return within 3-inch FRP containment.
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring

REGULATORY STATUS: Regulated but deferred from leak detection (emergency generator UST)

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells present without monitoring probes installed. Monitoring wells in the vicinity of UST.

USAGE: Supplies fuel to emergency generator

RECOMMENDATIONS:

Interstitial monitoring probe should be connected. The monitoring system console indicated "low brine".

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Connect interstitial monitoring probe	N/A (under warranty)
	<ul style="list-style-type: none">• Repair or reprogram monitoring system console	N/A (under warranty)
	<ul style="list-style-type: none">• Prepare and implement an O & M Plan for the USTs	See 1265-94-1

UST ID No.: CB124-94-1¹

CONTENTS: Waste oil

BUILDING No.: CB124 (Operations/Maintenance)

CAPACITY (gal.): 600

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP

Direct Tank Openings: 4-inch clean-out port

Cathodic Protection: None (NA)

Spill Prevention: Catchment basin, 7" concrete containment curb surrounding concrete pad.

Overfill Prevention: High level alarm with automatic shut off at 95% capacity

Leak Detection: Interstitial monitoring brine, automatic tank gauge

Vapor Recovery System: None (NA)

Monitoring System Console: INCON TS-1000/2-P

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP

Delivery Type: Gravity drain

Cathodic Protection: None (NA)

Leak Detection: Interstitial monitoring¹

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells with no monitoring probes.

USAGE: Contains waste oil collected from repair/maintenance operations on vessels.

RECOMMENDATIONS:

The monitoring system console indicated "high water alarm"; the cause of the alarm should be evaluated and either repaired or the console reprogrammed. If the sump probe (if present) has been submerged in water for an extended period of time, the probe should be tested.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair or reprogram monitoring system• Test sump probe• Prepare and implement an O & M Plan for the USTs	N/A (under warranty) See 1265-94-1

¹ No visual inspection possible. Information based on activity personnel.

UST ID No.: CB301-94-3

CONTENTS: Waste oil

BUILDING No.: CB301 (Vehicle Maintenance)

CAPACITY (gal.): 600

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm with automatic shut off at 95% capacity
Leak Detection: Interstitial monitoring (brine), automatic tank gauging
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/4P

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP
Delivery Type: Gravity drain
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells with no monitoring probes.

USAGE: Collects waste oil from drain inside "heavy shop" portion of Building 301.

RECOMMENDATIONS:

Sump probe in catchment basin was submerged in water. Water should be removed and sump probe should be tested to determine if replacement is necessary. The monitoring system console indicated a "high water alarm". If the cause of this alarm is not the water in the sump, then the cause should be evaluated and corrected.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Remove water from sump and test probe. Replace probe if necessary.Prepare and implement O & M Plan for USTs	N/A (under warranty) See 1265-94-1

UST ID No.: CB301-94-4

CONTENTS: Waste oil

BUILDING No.: CB301 (Vehicle Maintenance)

CAPACITY (gal.): 2,500

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm with automatic shut off at 95% capacity
Leak Detection: Interstitial monitoring (brine), automatic tank gauging
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/4P

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP containment
Delivery Type: Gravity drain
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells with no monitoring probes

USAGE: Collects waste oil from drain inside "light shop" portion of Building 301.

RECOMMENDATIONS:

The monitoring system console indicated a "high water alarm". The cause of the alarm should be evaluated and corrected.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair or reprogram monitoring system• Prepare and implement O & M Plan for the USTs	N/A (under warranty) See 1265-94-1

UST ID No.: CB304-94-1

CONTENTS: Diesel

BUILDING No.: CB301/CB302 (Gas Fill)

CAPACITY (gal.): 6,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut off (at 95% capacity)
Leak Detection: Interstitial monitoring (brine), automatic tank gauging
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/4P (inside Bldg. 301)

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells without monitoring probes. Monitoring wells in the vicinity of UST.

USAGE: Vehicle fueling.

RECOMMENDATIONS:

The monitoring system console, which is located in Bldg. CB301, indicated a "high water alarm". If the cause of this alarm is not the water in the sump for UST CB301-94-4, then the cause should be evaluated and corrected.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Repair or reprogram monitoring system• Prepare and implement an O & M Plan for the USTs	N/A (under warranty) See 1265-94-1

UST ID No.: CB304-94-2

CONTENTS: Unleaded gasoline

BUILDING No.: CB301/CB302 (Gas Fill)

CAPACITY (gal.): 6,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch fill
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: High level alarm (at 90% capacity) with automatic shut off (at 95% capacity)
Leak Detection: Interstitial monitoring (brine), automatic tank gauging
Vapor Recovery System: Stage I
Monitoring System Console: INCON TS-1000/4P (inside Bldg. 301)

PIPING INFORMATION:

Construction: 2-inch FRP within 3-inch FRP
Delivery Type: Suction
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Four observation wells without monitoring probes. Monitoring wells in the vicinity of UST.

USAGE: Vehicle fueling.

RECOMMENDATIONS:

The secondary containment pipe for the supply piping was sealed which restricts a leak from the supply piping from draining to the sump to be detected by the sump probe. If this sump probe is the only method of leak detection, it is recommended that the plastic piece sealing the secondary containment be removed. The monitoring system console, which is located in Bldg. CB301, indicated a "high level alarm". If the cause of this alarm is not the water in the sump for UST CB301-94-4, then the cause should be evaluated and corrected.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Remove plastic piece	N/A (under warranty)
	<ul style="list-style-type: none">Repair or reprogram monitoring system	N/A (under warranty)
	<ul style="list-style-type: none">Prepare and implement an O & M Plan for the USTs	See 1265-94-1

UST ID No.: CB317-94-1

CONTENTS: Waste oil

BUILDING No.: CB317 (Warehouse)

CAPACITY (gal.): 1,000

STATUS: Active

YEAR INSTALLED: 1994

TIGHTNESS TEST: Continual

UST INFORMATION:

Construction: Double-walled FRP
Direct Tank Openings: 4-inch clean-out port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin, 6" concrete containment curb surrounding concrete pad
Overfill Prevention: High level alarm with automatic shut off at 95% capacity
Leak Detection: Interstitial monitoring (brine), automatic tank gauge
Vapor Recovery System: None (NA)
Monitoring System Console: INCON TS-1000/2-P

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Gravity drain
Cathodic Protection: None (NA)
Leak Detection: Interstitial monitoring (piping slopes towards tank sump which is equipped with a sump probe).

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance

MONITORING WELLS PRESENT: Two observation wells without monitoring probes.

USAGE: Collects waste oil from drain inside Bldg. CB317.

RECOMMENDATIONS:

Sump probe in catchment basin was submerged in water. Water should be removed and sump probe tested to determine if replacement is necessary. If water collection in the sumps continues to be a problem, a metal cover could be placed over the containment dike to prevent water from collecting within the curbed area.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Remove water from sump and test sump probe	N/A (under warranty)
	• Replace probe if necessary	N/A (under warranty)
	• Prepare and implement an O & M Plan for the USTs	See 1265-94-1

UST ID No.: ECTGO-1

CONTENTS: Unleaded advantage (mid-grade) MOGAS

BUILDING No.: CITGO (Gate 5)

CAPACITY (gal.): 12,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: May 5, 1992 (after installation); continual leak detection

UST INFORMATION:

Construction: Single-wall fiberglass clad steel

Direct Tank Openings: 4-inch fill port

Cathodic Protection: None (NA)

Spill Prevention: Catchment basin

Overfill Prevention: 4-inch ball float valve (vent flow restrictor), inlet flow restrictor, high level alarm

Leak Detection: Groundwater monitoring, automatic tank gauging

Vapor Recovery System: Stage I vapor recovery, Stage II vapor recovery piping for future use (1" galvanized piping within 2" FRP trunk; capped beneath each gasoline dispenser).

Monitoring System Console: Red Jacket 40062-5

PIPING INFORMATION:

Construction: Double-walled FRP (sump full of fuel/product and could not verify that piping was double-walled.

Delivery Type: Pressurized

Cathodic Protection: None (NA)

Leak Detection: Red Jacket line leak detector

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance

MONITORING WELLS PRESENT: Four observation wells with groundwater monitoring probes surrounding USTs ECTGO-1, 2, & 3.

USAGE: Vehicle fuel.

RECOMMENDATIONS:

Fuel/water (approximately 6 to 10") was observed in the tank sump with the pump and product line; source of fuel not identified during site visit. The fuel/water should be removed from the sump and the source of the fuel should be evaluated.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	• Remove fuel/water from sump with pump and product line	N/A (under warranty)
	• Evaluate source of fuel	N/A (under warranty)
	• Prepare and implement an O & M Plan for the USTs	See 1265-94-1

UST ID No.: ECTGO-2

CONTENTS: Premium unleaded MOGAS

BUILDING No.: CITGO (Gate 5)

CAPACITY (gal.): 12,000

STATUS: Active

YEAR INSTALLED: 1992

TIGHTNESS TEST: May 5, 1992 (after installation); continual leak detection

UST INFORMATION:

Construction: Single-wall fiberglass clad steel
Direct Tank Openings: 4-inch fill port
Cathodic Protection: None (NA)
Spill Prevention: Catchment basin
Overfill Prevention: 4-inch ball float valve (vent flow restrictor), inlet flow restrictor, high level alarm
Leak Detection: Groundwater monitoring, automatic tank gauging
Vapor Recovery System: Stage I vapor recovery, Stage II vapor recovery piping for future use (1" galvanized piping within 2" FRP trunk; capped beneath each gasoline dispenser).
Monitoring System Console: Red Jacket 40062-5

PIPING INFORMATION:

Construction: Double-walled FRP
Delivery Type: Pressurized
Cathodic Protection: NA
Leak Detection: Red Jacket line leak detector

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: Not in compliance

MONITORING WELLS PRESENT: Four observation wells with groundwater monitoring probes surrounding USTs ECTGO-1, 2, & 3.

USAGE: Vehicle fuel.

RECOMMENDATIONS:

Fuel/water (approximately 6 to 10") was observed in the sump with the pump and product line; source of fuel not identified during site visit. The fuel/water should be removed from the sump and the source of the fuel should be evaluated.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">• Remove fuel/water from sump with pump and product line• Evaluate source of fuel• Prepare and implement an O & M Plan for the USTs	N/A (under warranty) See 1265-94-1

UST ID No.: LSTP-17

CONTENTS: Empty (formerly Waste F-76 Diesel)

BUILDING No.: Pier 17

CAPACITY (gal.): 1,000

STATUS: Out-of-service

YEAR INSTALLED: 1951 (or 1956)

TIGHTNESS TEST: None

UST INFORMATION:

Construction: Single-wall bare steel
Direct Tank Openings: 24" manway to vault
Cathodic Protection: None
Spill Prevention: In concrete vault
Overfill Prevention: In concrete vault
Leak Detection: None
Vapor Recovery System: None
Monitoring System Console: None

PIPING INFORMATION:

Construction: Single-wall unprotected metal
Delivery Type: Gravity
Cathodic Protection: None
Leak Detection: None

REGULATORY STATUS: In compliance

COMPLIANCE STATUS: Exempt (emergency spill/overflow containment UST that is expeditiously emptied).

MONITORING WELLS PRESENT: In vicinity

USAGE: Out-of-service (formerly used to contain spills or overfills).

RECOMMENDATIONS:

The contract to remove USTs LSTP-12 and LSTP-17 and to close the associated piping in place is currently in progress. The activity plans are to close the concrete vault for USTs LSTP-12 and LSTP-17 in place. DEQ should be notified of the removal of these tanks upon completion (as planned by the Activity); the tanks will not be replaced.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Remove UST	N/A (under contract)
	<ul style="list-style-type: none">Notify the DEQ after the UST closure is completed	N/A

UST ID No.: LSTP-12

CONTENTS: Empty (formerly Waste F-76 Diesel)

BUILDING No.: Piers 12 and 13

CAPACITY (gal.): 1,000

STATUS: Out-of-service

YEAR INSTALLED: 1951

TIGHTNESS TEST: None

UST INFORMATION:

Construction: Single-walled bare steel
Direct Tank Openings: 24" manway to vault
Cathodic Protection: None
Spill Prevention: In concrete vault
Overfill Prevention: In concrete vault
Leak Detection: None
Vapor Recovery System: None
Monitoring System Console: None

PIPING INFORMATION:

Construction: Single-walled unprotected metal
Delivery Type: Gravity
Cathodic Protection: None
Leak Detection: None

REGULATORY STATUS: In compliance

COMPLIANCE STATUS: Exempt (emergency spill/overflow containment UST that is expeditiously emptied).

MONITORING WELLS PRESENT: In vicinity

USAGE: Out-of-service (formerly used to contain spills or overfills).

RECOMMENDATIONS:

The contract to remove USTs LSTP-12 and LSTP-17 and to close the associated piping in place is currently in progress. The activity plans to close the concrete vault for USTs LSTP-12 and LSTP-17 in place. DEQ should be notified of the removal of these tanks upon completion (as planned by the Activity); the tanks will not be replaced.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
1995	<ul style="list-style-type: none">Remove USTNotify the DEQ of closure after the UST closure is completed	N/A (under contract)

UST ID No.: SURTASS-1

CONTENTS: Sand/concrete
(formerly Norpar)

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Closed-in-place (3/10/95)

YEAR INSTALLED: 1985

TIGHTNESS TEST: None

UST INFORMATION:

Construction: Single-wall FRP
Direct Tank Openings: NA
Cathodic Protection: None (NA)
Spill Prevention: NA (catchment basin filled)
Overfill Prevention: NA
Leak Detection: NA
Vapor Recovery System: NA
Monitoring System Console: NA

PIPING INFORMATION:

Construction: Single-walled galvanized steel
Delivery Type: NA (formerly pressurized)
Cathodic Protection: None
Leak Detection: NA

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance (DEQ has been notified)

MONITORING WELLS PRESENT: In vicinity

USAGE: Permanently closed.

RECOMMENDATIONS:

No recommendations.

YEAR

ACTION

CONSTRUCTION
BUDGET

No recommendations

UST ID No.: SURTASS-2

CONTENTS: Sand/concrete
(formerly Norpar)

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 8,000

STATUS: Closed-in-place (3/10/95)

YEAR INSTALLED: 1985

TIGHTNESS TEST: None

UST INFORMATION:

Construction: Single-wall FRP
Direct Tank Openings: NA
Cathodic Protection: None (NA)
Spill Prevention: NA (catchment basin filled)
Overfill Prevention: NA
Leak Detection: NA
Vapor Recovery System: NA
Monitoring System Console: NA

PIPING INFORMATION:

Construction: Single-walled galvanized steel
Delivery Type: NA (formerly pressurized)
Cathodic Protection: None
Leak Detection: NA

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance (DEQ has been notified)

MONITORING WELLS PRESENT: In vicinity

USAGE: Permanently closed.

RECOMMENDATIONS:

No recommendations.

YEAR

ACTION

CONSTRUCTION
BUDGET

No recommendations

UST ID No.: SURTASS-3

CONTENTS: Sand/concrete
(formerly Waste Norpar)

BUILDING No.: 1558 (SURTASS)

CAPACITY (gal.): 4,000

STATUS: Closed-in-place (3/95)

YEAR INSTALLED: 1985

TIGHTNESS TEST: None

UST INFORMATION:

Construction: Single-wall FRP
Direct Tank Openings: NA
Cathodic Protection: None (NA)
Spill Prevention: NA (catchment basin filled)
Overfill Prevention: NA
Leak Detection: NA
Vapor Recovery System: NA
Monitoring System Console: NA

PIPING INFORMATION:

Construction: Single-walled unprotected steel
Delivery Type: NA (formerly gravity)
Cathodic Protection: None
Leak Detection: NA

REGULATORY STATUS: Regulated

COMPLIANCE STATUS: In compliance (DEQ has been notified)

MONITORING WELLS PRESENT: In vicinity

USAGE: Permanently closed.

RECOMMENDATIONS:

No recommendations.

<u>YEAR</u>	<u>ACTION</u>	<u>CONSTRUCTION BUDGET</u>
	No recommendations	

SECTION 7.0
NAVY DATABASE PRINTOUT

DUMP OF NAVY TANK DATABASE

06/14/95

TANK NO.	YR. INS.	CON- TENTS	REG. ?	ABV. CAPACITY	TANK UDR.	PIPE CONST.	LD TYPE	STA- TUS	PRES. SUCT.	T DATE	PRP COMPLIANCE	RISK RATE	TG DATE	PROP ACT	PCR	EST BUDGET	ACT COMPL	INVENTORY R_M_F	SPILL HISTORY	REMARKS
1265-94-1	94	D	Y	4000	U	DWFRP	CuFRP	AG/IM	A	S	/ /		/ /				0 / /			
1265-94-2	94	W	Y	4000	U	DWFRP	DWFRP	AG/IM	A	G	/ /		/ /				0 / /			
1516-94-3	94	G	Y	6000	U	DWFRP	FRP	AG/IM	A	P	/ /		/ /				0 / /			
1516-94-4	94	D	Y	6000	U	DWFRP	FRP	IM	A	P	/ /		/ /				0 / /			
1551	51	D	Y	567000	U	SC	SWS	TT/AG	A	P	/ /		/ /				0 / /			
1586	93	I	Y	8000	U	DWFRP	SWS	NA	A	P	/ /		/ /				0 / /			
1558-94-1	94	N	Y	8000	U	DWFRP	FRP	IM	A	P	/ /		/ /				0 / /			
1558-94-2	94	N	Y	8000	U	DWFRP	FRP	IM	A	P	/ /		/ /				0 / /			
1558-94-3	94	W	Y	8000	U	DWFRP	FRP	IM	A	P	/ /		/ /				0 / /			
1612-19	92	G	Y	10000	U	DWFRP	DWFRP	IM	A	P	/ /		/ /				0 / /			
1612-20	92	G	Y	10000	U	DWFRP	DWFRP	IM	A	P	/ /		/ /				0 / /			
1612-21	92	G	Y	10000	U	DWFRP	DWFRP	IM	A	P	/ /		/ /				0 / /			
1618-94-1	94	D	Y	4000	U	DWFRP	DWFRP	IM	A	S	/ /		/ /				0 / /			
3505-94-1	94	D	Y	600	U	DWFRP	CuFRP	IM	A	S	/ /		/ /				0 / /			
3827-94-1	94	W	Y	600	U	DWFRP	DWFRP	IM	A	G	/ /		/ /				0 / /			
3827-2	86	S	Y	550	U	SWS	SWM	NA	I	G	/ /		/ /				0 / /			
3868-3	92	W	Y	10000	U	DWFRP	SWFe	NA	A	G	/ /		/ /				0 / /			
3872-94-1	94	W	Y	500	U	DWFRP	FRP	IM	A	G	/ /		/ /				0 / /			
757-94-1	94	D	Y	4000	U	DWFRP	CuFRP	IM	A	S	/ /		/ /				0 / /			
CB124-94-4	94	W	Y	600	U	DWFRP	FRP	IM	A	G	/ /		/ /				0 / /			
CB301-94-3	94	W	Y	2500	U	DWFRP	FRP	IM	A	G	/ /		/ /				0 / /			

ECJID: CB301-94-4

DUMP OF NAVY TANK DATABASE

06/14/95

TANK NO.	YR. INS.	CON- TENTS	REG. ?	ABV. CAPACITY	TANK UDR.	PIPE CONST.	LD CONST.	STA- TYPE	PRES. TUS	T SUCT.	T DATE	PRP COMPLIANCE	RISK RATE	TG DATE	PROP ACT	PCR	EST BUDGET	ACT COMPL	INVENTORY R_M_F	SPILL HISTORY	REMARKS
CB301-94-4	94	W	Y	600	U	DWFRP	FRP	IM	A	G	/ /			/ /				0 / /			
CB304-94-1	94	D	Y	6000	U	DWFRP	FRP	IM	A	S	/ /			/ /				0 / /			
CB304-94-2	94	G	Y	6000	U	DWFRP	FRP	IM/AG	A	S	/ /			/ /				0 / /			
CB317-94-1	94	W	Y	1000	U	DWFRP	DWFRP	IM	A	G	/ /			/ /				0 / /			
ECTGO-1	92	M	Y	12000	U	SWFRP	DWFRP	RJ	A	P	/ /			/ /				0 / /			
ECTGO-2	92	M	Y	12000	U	SWFRP	DWFRP	RJ	A	P	/ /			/ /				0 / /			
ECTGO-3	92	M	Y	12000	U	SWFRP	DWFRP	RJ	A	P	/ /			/ /				0 / /			
LSTP-17	51	E	Y	1000	U	SWS	SWM	NA	I	G	/ /			/ /				0 / /			
LSTP-12	51	E	Y	1000	U	SWS	SWM	NA	I	G	/ /			/ /				0 / /			
SURTASS-1	85	S	Y	8000	U	SWFRP	SWG	NA	I		/ /			/ /				0 / /			
SURTASS-2	85	S	Y	8000	U	SWFRP	SWG	NA	I		/ /			/ /				0 / /			
SURTASS-3	85	S	Y	4000	U	SWFRP	SWS	NA	I		/ /			/ /				0 / /			

SECTION 8.0
LANTDIV DATABASE PRINTOUT

TANK DATABASE DUMP OF TABLE 1

06/14/95

TANK NO.	ABV. UDR.	BLDG. CLOSEST TO TANK	YR. INS.	CAPACITY	REG. ?	TANK STATUS	PRES. SUCT.	TANK CONTENTS	TANK USE	TANK CONSTRUCTION	PIPE CONSTRUCTION	T DATE	INVENTORY R_M_F	SPILL HISTORY	LEAK DETECTION?	LEAK DETECTION TYPE
1265-94-1	U	1265	94	4000	Y	ACTIVE	S	DIESEL	ENGINE TESTING	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	3/4-INCH COPPER SUPPLY AND RETURN LINES WITHIN 3-INCH FRP CONTAINMENT PIPE	/ /			Y	INTERSTITIAL MONITORING
1265-94-2	U	1265	94	4000	Y	ACTIVE	G	WASTE OIL	WASTE OIL COLLECTION	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING
1516-94-3	U	1516	94	6000	Y	ACTIVE	P	UNLEADED GASOLINE	MARINE BOAT FUEL	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING
1516-94-4	U	1516	94	6000	Y	ACTIVE	P	DIESEL	MARINE BOAT FUEL	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING
1551	U	1551	51	567000	Y	ACTIVE	P	F-76 DIESEL FUEL	MAIN DIESEL SUPPLY	SINGLE-WALLED CONCRETE	SINGLE-WALLED STEEL	/ /			Y	TIGHTNESS TEST/AUTOMATIC GAUGING
1586	U	1558	93	8000	Y	ACTIVE	P	ISOPAR	MODULE RESEARCH	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	SINGLE-WALLED STEEL	/ /			N	
1558-94-1	U	1558	94	8000	Y	ACTIVE	P	NORPAR	MODULE RESEARCH	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING
1558-94-2	U	1558	94	8000	Y	ACTIVE	P	NORPAR	MODULE RESEARCH	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING
1558-94-3	U	1558	94	8000	Y	ACTIVE	P	WASTE OIL	WASTE OIL COLLECTION	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	FIBERGLASS REINFORCED PLASTIC	/ /			Y	INTERSTITIAL MONITORING

TANK DATABASE DUMP OF TABLE 1

06/14/95

TANK NO.	ABV. UDR.	BLDG. CLOSEST TO TANK	YR. INS.	CAPACITY	REG. ?	TANK STATUS	PRES. SUCT.	TANK CONTENTS	TANK USE	TANK CONSTRUCTION	PIPE CONSTRUCTION	T DATE	INVENTORY R_M_F	SPILL HISTORY	LEAK DETECTION?	LEAK DETECTION TYPE
ECTGO-2	U	CITGO	92	12000	Y	ACTIVE	P	MOGAS PREMIUM	VEHICLE FUEL	SINGLE-WALLED FIBERSTEEL	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	/ /			Y	RED JACKET LINE LEAK DETECTOR
ECTGO-3	U	CITGO	92	12000	Y	ACTIVE	P	MOGAS REGULAR	VEHICLE FUEL	SINGLE-WALLED FIBERSTEEL	DOUBLE-WALLED FIBERGLASS REINFORCED PLASTIC	/ /			Y	RED JACKET LINE LEAK DETECTOR
LSTP-17	U	PIER 17	51	1000	Y	OUT-OF-SERVICE	G	EMPTY	OUT-OF-SERVICE	SINGLE-WALLED STEEL	SINGLE-WALLED METAL	/ /			N	NONE
LSTP-12	U	PIER 12/1	51	1000	Y	OUT-OF-SERVICE	G	EMPTY	OUT-OF-SERVICE	SINGLE-WALLED STEEL	SINGLE-WALLED METAL	/ /			N	NONE
SURTASS-1	U	1558	85	8000	Y	CLOSED-IN-PLACE		SAND/CONCRETE	CLOSED-IN-PLACE	SINGLE-WALLED FIBERGLASS REINFORCED PLASTIC	SINGLE-WALLED GALVANIZED STEEL	/ /			N	NONE
SURTASS-2	U	1558	85	8000	Y	CLOSED-IN-PLACE		SAND/CONCRETE	CLOSED-IN-PLACE	SINGLE-WALLED FIBERGLASS REINFORCED PLASTIC	SINGLE-WALLED GALVANIZED STEEL	/ /			N	NONE
SURTASS-3	U	1558	85	4000	Y	CLOSED-IN-PLACE		SAND/CONCRETE	CLOSED-IN-PLACE	SINGLE-WALLED FIBERGLASS REINFORCED PLASTIC	SINGLE-WALLED UNPROTECTED STEEL	/ /			N	NONE

TANK DATABASE DUMP OF TABLE 2 IN-SERVICE UST's

06/14/95

TANK NUMBER	YEAR INSTALLED	LEAK DETECTION TYPE	DATE OF LAST LEAK DETECTION ACTION	REQUIRED LEAK DETECTION ACTION	DATE REQUIRED LEAK DETECTON	ACTION STATUS
=====	=====	=====	=====	=====	=====	=====
1265-94-1	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
1265-94-2	94	INTERSTITIAL MONITORING	/ /		0	
1516-94-3	94	INTERSTITIAL MONITORING	/ /		0	
1516-94-4	94	INTERSTITIAL MONITORING	/ /		0	
1551	51	TIGHTNESS TEST/AUTOMATIC GAUGING	/ /		0	
1586	93	NONE	/ /		0	
1558-94-1	94	INTERSTITIAL MONITORING	/ /		0	
1558-94-2	94	INTERSTITIAL MONITORING	/ /		0	
1558-94-3	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
1612-19	92	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
1612-20	92	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
1612-21	92	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
1618-94-1	94	INTERSTITIAL MONITORING	/ /		0	
3505-94-1	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
3827-94-1	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
3868-3	92	NONE	/ /		0	
3872-94-1	94	INTERSTITIAL MONITORING	/ /		0	
757-94-1	94	INTERSTITIAL MONITORING	/ /		0	

TANK DATABASE DUMP OF TABLE 2 IN-SERVICE UST's

06/14/95

TANK NUMBER =====	YEAR INSTALLED =====	LEAK DETECTION TYPE =====	DATE OF LAST LEAK DETECTION ACTION =====	REQUIRED LEAK DETECTION ACTION =====	DATE REQUIRED LEAK DETECTION =====	ACTION STATUS =====
CB124-94- 4	94	INTERSTITIAL MONITORING	/ /		0	
CB301-94- 3	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
CB304-94- 1	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
CB304-94- 2	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
CB317-94- 1	94	INTERSTITIAL MONITORING (PIPING SLOPES TOWARDS TANK SUMP WHICH IS EQUIPPED WITH A SUMP PROBE)	/ /		0	
ECTGO-1	92	RED JACKET LINE LEAK DETECTOR	/ /		0	
ECTGO-2	92	RED JACKET LINE LEAK DETECTOR	/ /		0	
ECTGO-3	92	RED JACKET LINE LEAK DETECTOR	/ /		0	

TANK DATABASE DUMP OF TABLE 3 UST's WITH PRESSURIZED PIPING

06/14/95

TANK NUMBER	YEAR INSTALLED	LEAK DETECTION TYPE	DATE OF LAST LEAK DETECTION ACTION	REQUIRED LEAK DETECTION ACTION	DATE REQUIRED LEAK DETECTION	ACTION STATUS	RECOMMENDATION
=====	=====	=====	=====	=====	=====	=====	=====
1516-94-3	94	INTERSTITIAL MONITORING	/ /		0		AUTOMATIC TANK GAUGE NEEDS TO BE REPROGRAMMED OR REPAIRED
1516-94-4	94	INTERSTITIAL MONITORING	/ /		0		AUTOMATIC TANK GAUGE NEEDS TO BE REPROGRAMMED
1551	51	TIGHTNESS TEST/AUTOMATIC GAUGING	/ /		0		TIGHTNESS TESTING ON A REGULAR BASIS UNTIL FIELD CONSTRUCTED TANK REGULATIONS HAVE BEEN PROMULGATED
1586	93	NONE	/ /		0		REPLACE UNDERGROUND PIPING WITH DOUBLE-WALLED FIBERGLASS PIPING WITH INTERSTITIAL MONITORING
1558-94-1	94	INTERSTITIAL MONITORING	/ /		0		REPAIR MONITORING SYSTEM
1558-94-2	94	INTERSTITIAL MONITORING	/ /		0		REPAIR MONITORING SYSTEM
1558-94-3	94	INTERSTITIAL MONITORING	/ /		0		CONNECT INTERSTITIAL MONITORING PROBE PROPERLY, REPAIR MONITORING SYSTEM
1612-19	92	INTERSTITIAL MONITORING	/ /		0		NONE
1612-20	92	INTERSTITIAL MONITORING	/ /		0		NONE
1612-21	92	INTERSTITIAL MONITORING	/ /		0		NONE
ECTGO-1	92	RED JACKET	/ /		0		REMOVE FUEL/WATER FROM SUMP AND EVALUATE SOURCE
ECTGO-2	92	RED JACKET	/ /		0		REMOVE FUEL/WATER FROM SUMP AND EVALUATE SOURCE
ECTGO-3	92	RED JACKET	/ /		0		REMOVE FUEL/WATER FROM SUMP AND EVALUATE SOURCE

TANK DATABASE DUMP OF TABLE 4 OUT OF SERVICE UST's

06/14/95

TANK NUMBER	YEAR INSTALLED	CAPACITY	OUT OF SERVICE DATE	REMOVAL STATUS	PLANNED ACTIONS	REMOVAL RECOMMENDATION
=====	=====	=====	=====	=====	=====	=====
3827-2	86	550	/ /	CLOSED-IN-PLACE		NOTIFY VIRGINIA DEQ UST HAS BEEN CLOSED IN PLACE
LSTP-17	51	1000	/ /	OUT-OF-SERVICE		NOTIFY VIRGINIA DEQ UPON COMPLETION OF REMOVAL OF TANK
LSTP-12	51	1000	/ /	OUT-OF-SERVICE		NOTIFY VIRGINIA DEQ UPON COMPLETION OF REMOVAL OF TANK
SURTASS-1	85	8000	03/10/95	CLOSED-IN-PLACE		NONE
SURTASS-2	85	8000	03/10/95	CLOSED-IN-PLACE		NONE
SURTASS-3	85	4000	/ /	CLOSED-IN-PLACE		NONE

TANK DATABASE DUMP OF TABLE 5 LONG RANGE ACTION, ALL ACTIVE TANKS

06/14/95

TANK NUMBER	YEAR INSTALLED	OVERFILL PROTECTION INSTALLED?	SPILL PROTECTION INSTALLED?	OVERFILL/SPILL PROTECTION REQUIRED?	DATE OVERFILL/ SPILL PROTECTION REQUIRED	CATHODIC PROTECTION INSTALLED?	CATHODIC PROTECTION REQUIRED?	LONG TERM RECOMMENDATIONS	REPLACEMENT ALTERNATIVE RECOMMENDATION	ACTION STATUS
1265-94-1	94	Y	Y	N	0	N	N			
1265-94-2	94	Y	Y	N	0	N	N			
1516-94-3	94	Y	Y	N	0	N	N			
1516-94-4	94	Y	Y	N	0	N	N			
1551	51	Y	Y	N	0	Y	Y			
1586	93	Y	Y	N	0	N	N			
1558-94-1	94	Y	Y	N	0	N	N			
1558-94-2	94	Y	Y	N	0	N	N			
1558-94-3	94	Y	Y	N	0	N	N			
1612-19	92	Y	Y	N	0	N	N			
1612-20	92	Y	Y	N	0	N	N			
1612-21	92	Y	Y	N	0	N	N			
1618-94-1	94	Y	Y	N	0	N	N			
3505-94-1	94	N	Y	N	0	N	N			
3827-94-1	94	N	Y	N	0	N	N			
3868-3	92	Y	N	N	0	N	N			
3872-94-1	94	Y	Y	N	0	N	N			
757-94-1	94	Y	Y	N	0	N	N			
CB124-94-4	94	Y	Y	N	0	N	N			
CB301-94-3	94	Y	Y	N	0	N	N			

TANK DATABASE DUMP OF TABLE 5 LONG RANGE ACTION, ALL ACTIVE TANKS

06/14/95

TANK NUMBER =====	YEAR INSTALLED =====	OVERFILL PROTECTION INSTALLED? =====	SPILL PROTECTION INSTALLED? =====	OVERFILL/SPILL PROTECTION REQUIRED? =====	DATE OVERFILL/ SPILL PROTECTION REQUIRED =====	CATHODIC PROTECTION INSTALLED? =====	CATHODIC PROTECTION REQUIRED? =====	LONG TERM RECOMMENDATIONS =====	REPLACEMENT ALTERNATIVE RECOMMENDATION =====	ACTION STATUS =====
CB301-94- 4	94	Y	Y	N	0	N	N			
CB304-94- 1	94	Y	Y	N	0	N	N			
CB304-94- 2	94	Y	Y	N	0	N	N			
CB317-94- 1	94	Y	Y	N	0	N	N			
ECTGO-1	92	Y	Y	N	0	N	N			
ECTGO-2	92	Y	Y	N	0	N	N			
ECTGO-3	92	Y	Y	N	0	N	Y			

9.0 REFERENCES

- NAVPHIBASE LCREEK, 1986 - 1994 (approximate completion date). EPA Form 7530-1 (11-85) "Notification for Underground Storage Tanks," (from Federal Register, Vol. 50, No. 217, November 8, 1985) as submitted to Virginia Department of Environmental Quality (formerly Virginia State Water Control Board).
- DeBuchananne, G.D., 1968. Groundwater Resources of the Eastern Shore of Virginia and the James, York, and Rappahannock River Basins of Virginia East of the Fall Line.
- Mixon, R.B., Berquist, C.R.; Newell, W.L.; Johnson, G.H.; Powar, D.S.; Schindler, J.S.; and Rader, E.K.; 1989. Geologic Map and Generalized Cross-sections of the Coastal Plain and Adjacent Parts of the Piedmont, Virginia.
- Hamilton, Pixie A. & Larson, Jerry D., 1988. Hydrogeology and Analysis of the Ground-Water Flow System in the Coastal Plain of Southeastern Virginia, U.S. Geological Survey.
- Soil Conservation Service (SCS), 1985. Soil Survey of City of Virginia Beach, Virginia.

APPENDIX A
UST Site Figures

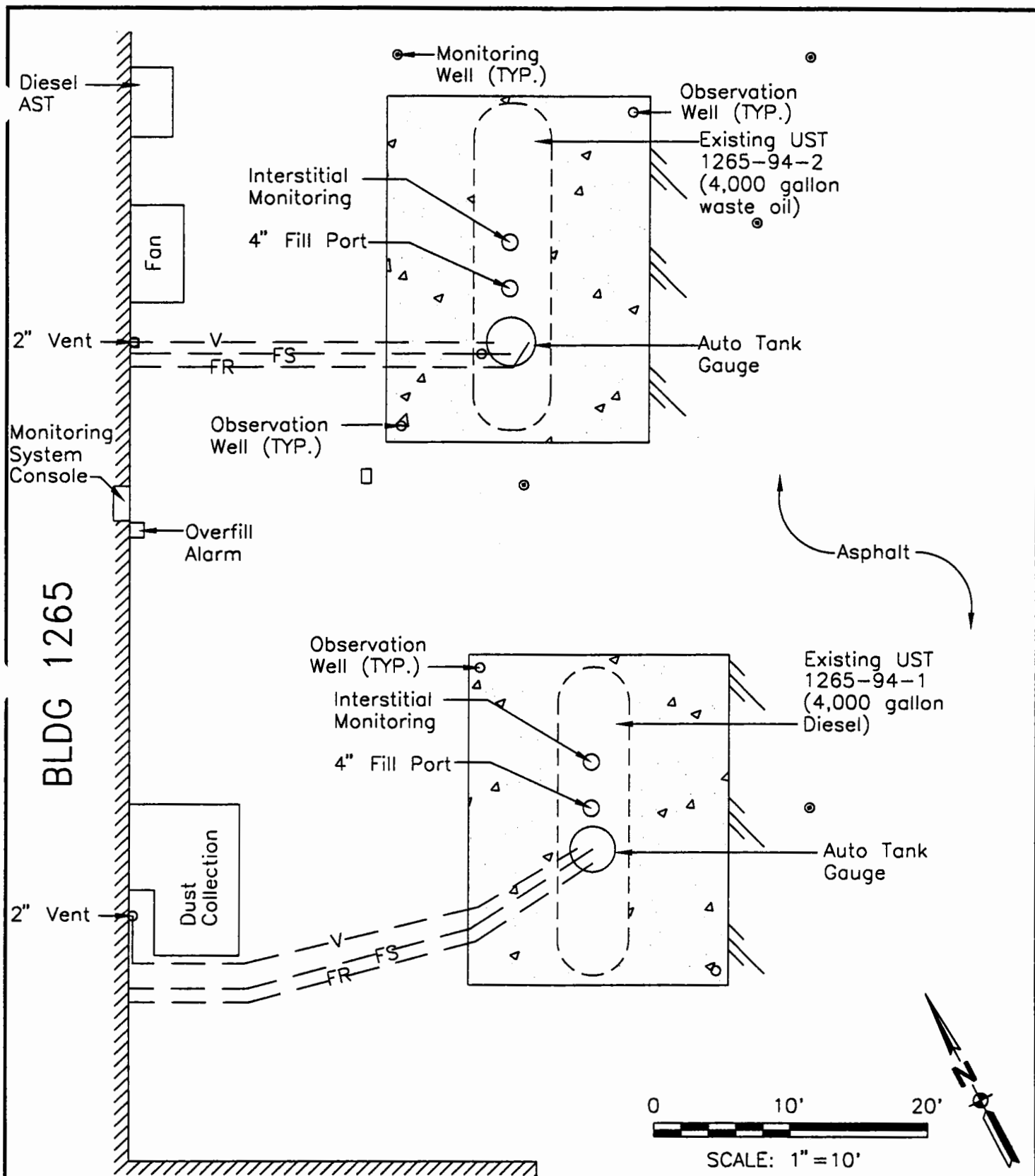
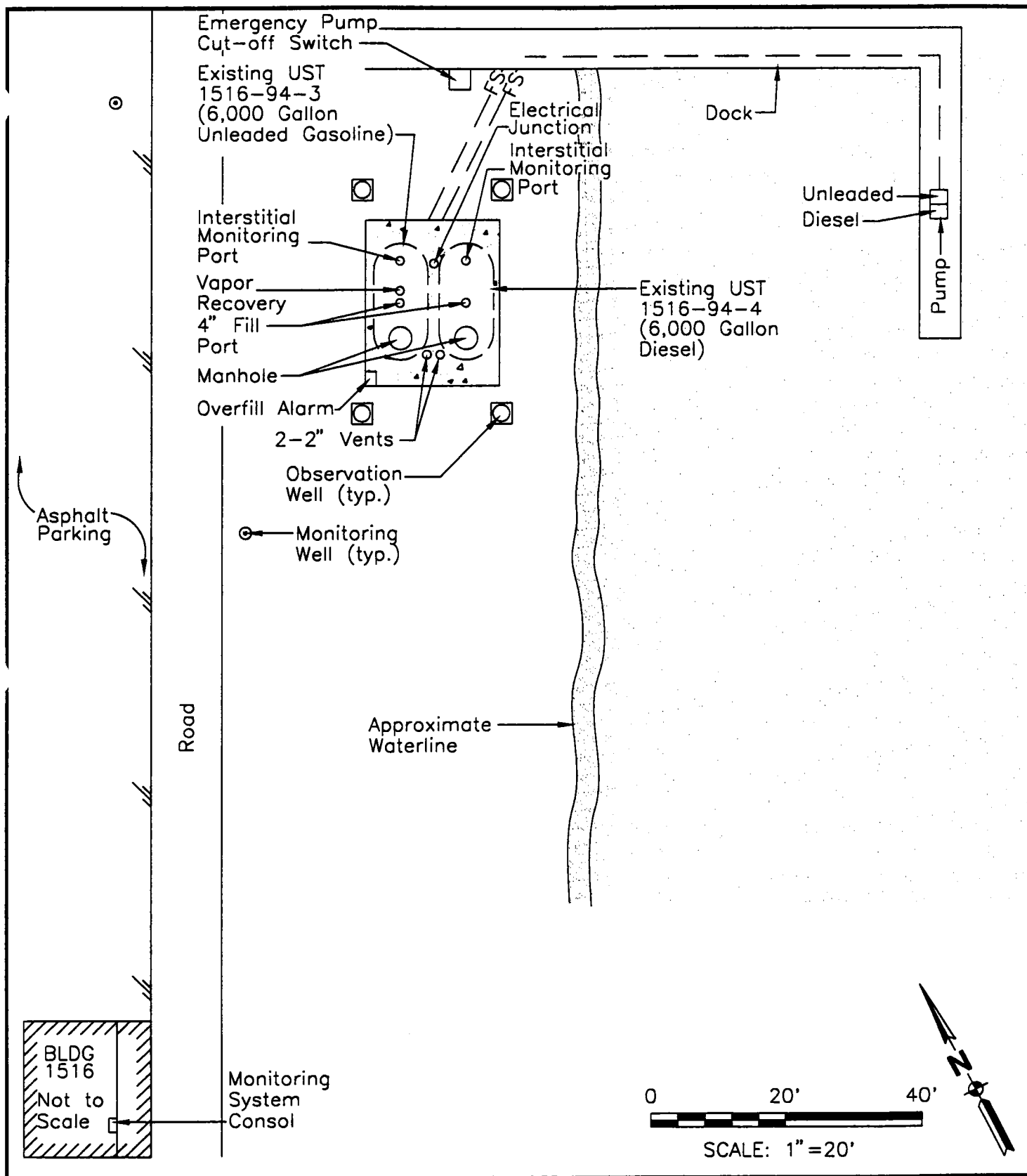


Figure 1
 UST 1265-94-1 (4,000 Gallon Diesel Oil UST)
 UST 1265-94-2 (4,000 Gallon Waste Oil UST)
 SIMA Shop
 NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore



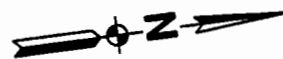
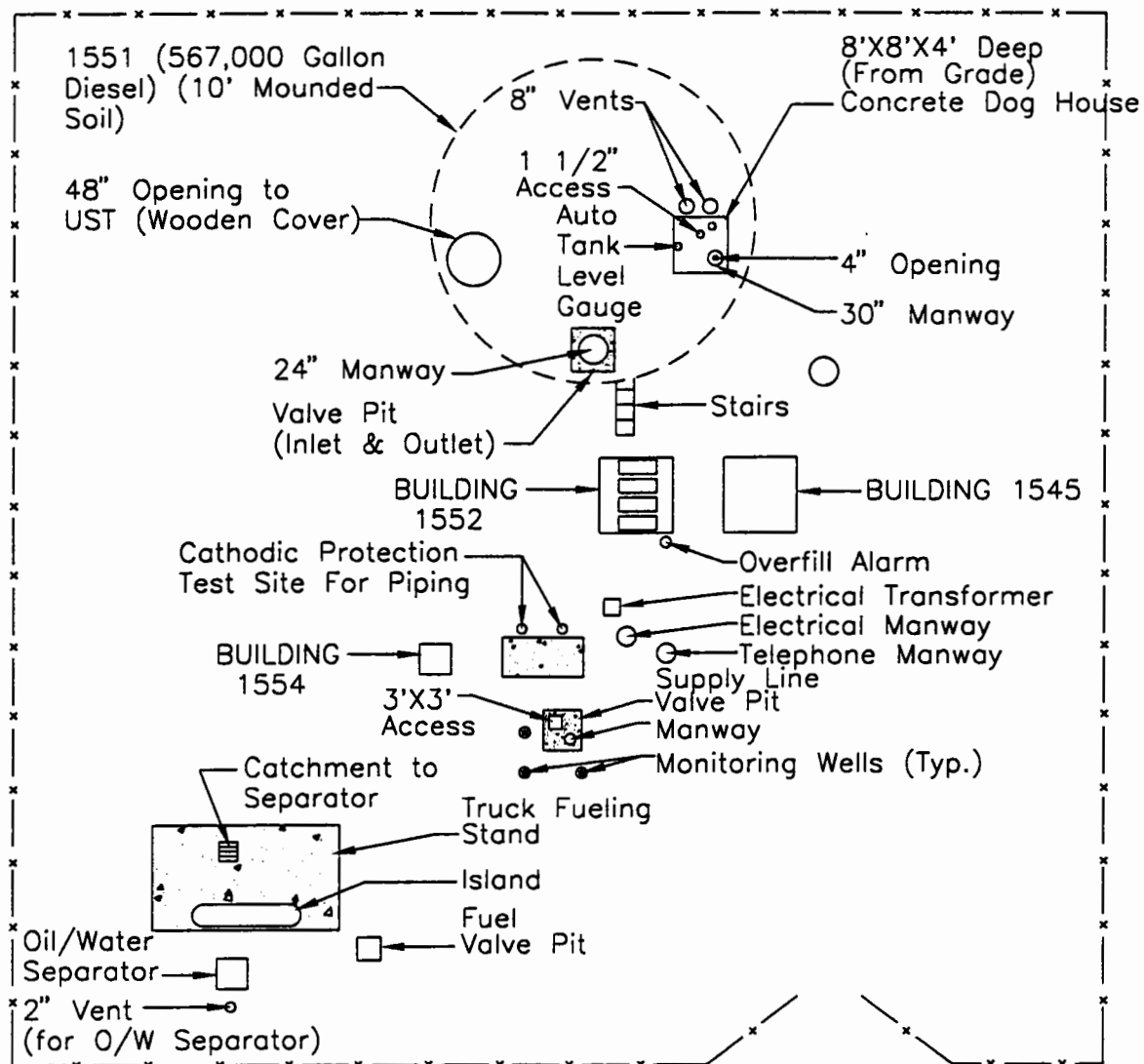
LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V — Vent Line

Figure 2
 UST 1516-94-3 (6,000 Gallon Unleaded Gasoline UST)
 UST 1516-94-4 (6,000 Gallon Diesel UST)

Marina
 NAVPHIBASE LCREEK
 Norfolk, Virginia

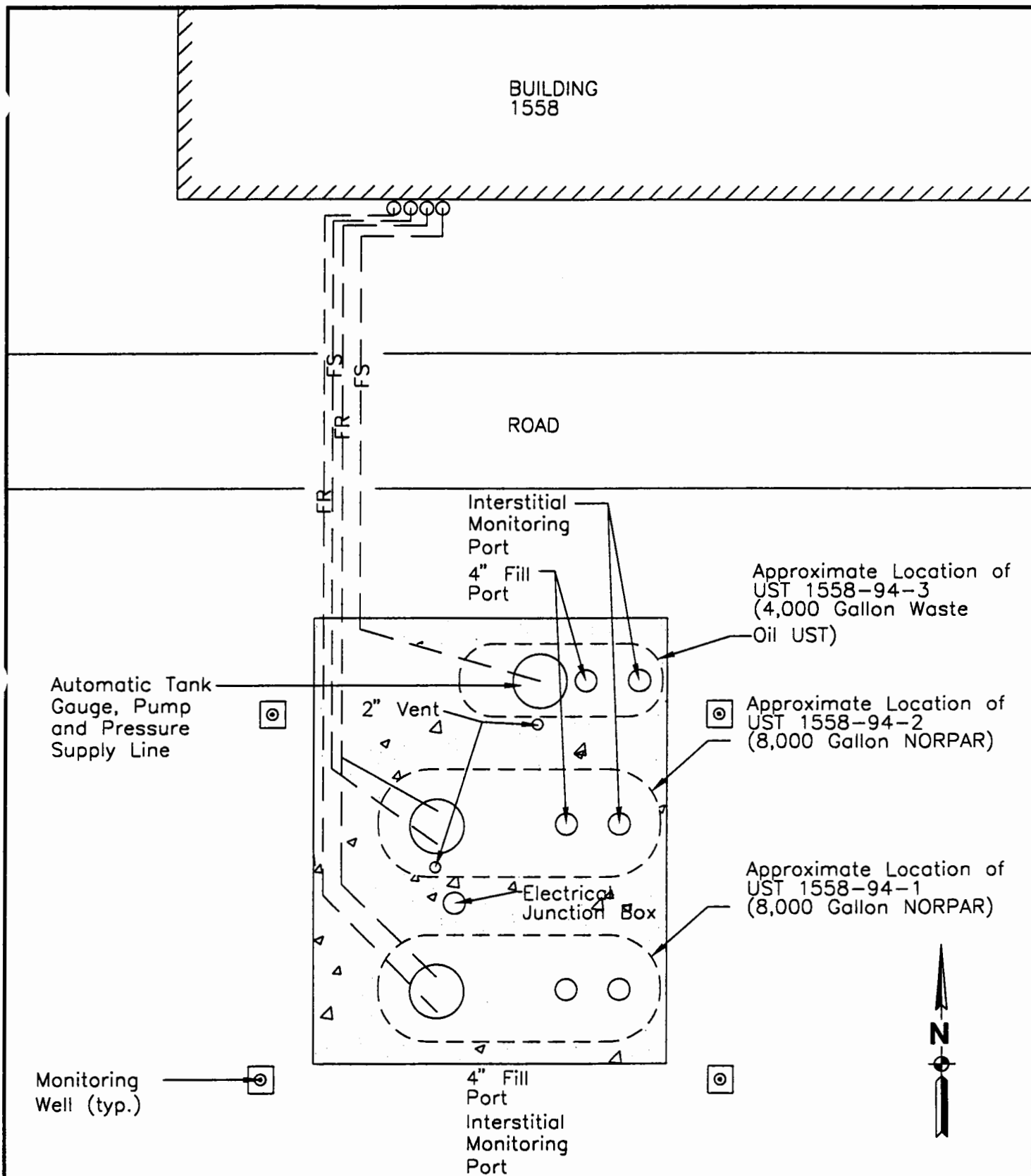
Dames & Moore



LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V — Vent Line

Figure 3
 UST 1551 (567,000 Gallon Diesel UST)
 Main Diesel Tank
 NAVPHIBASE LCREEK
 Norfolk, Virginia



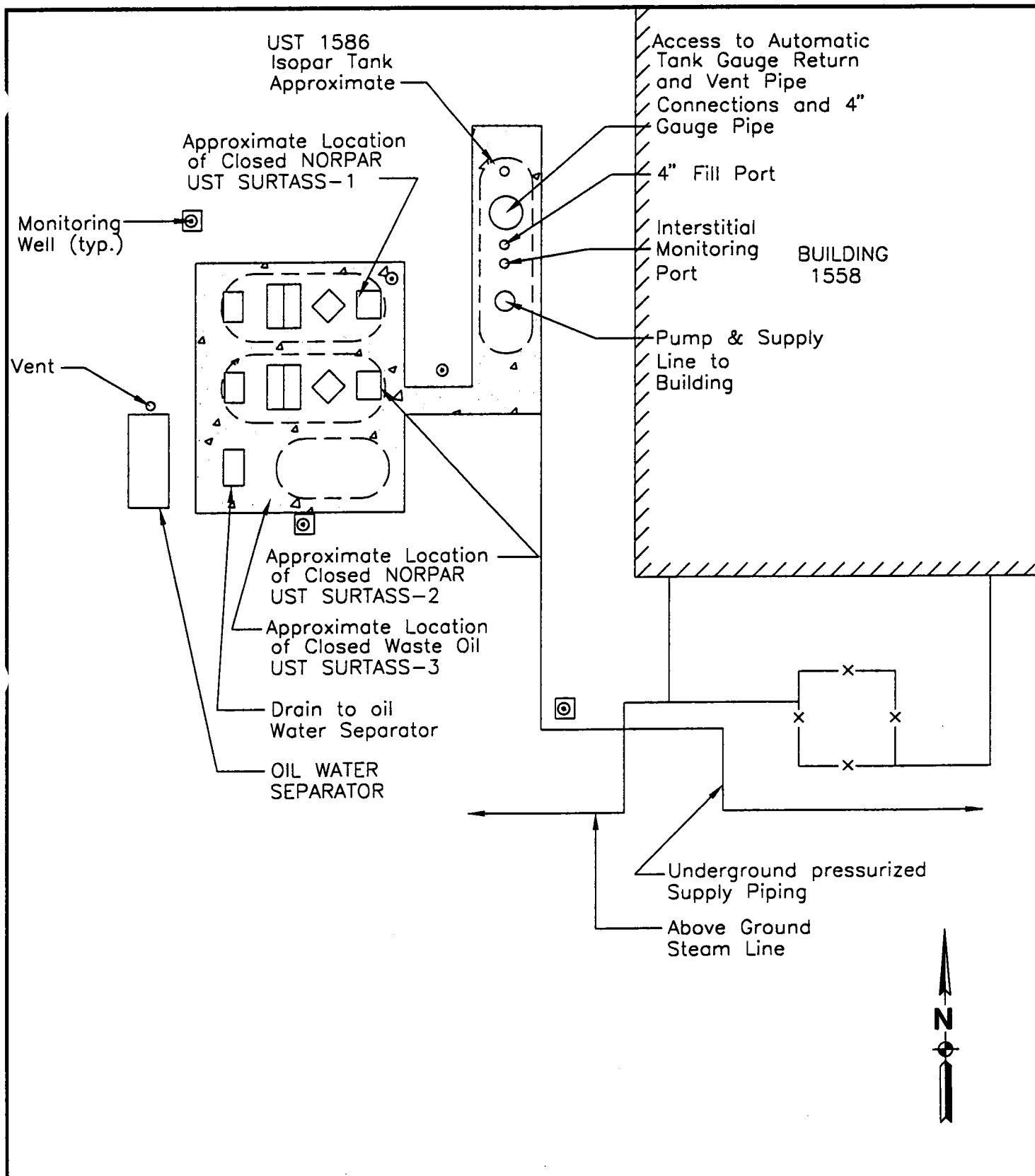
LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ≡ Asphalt

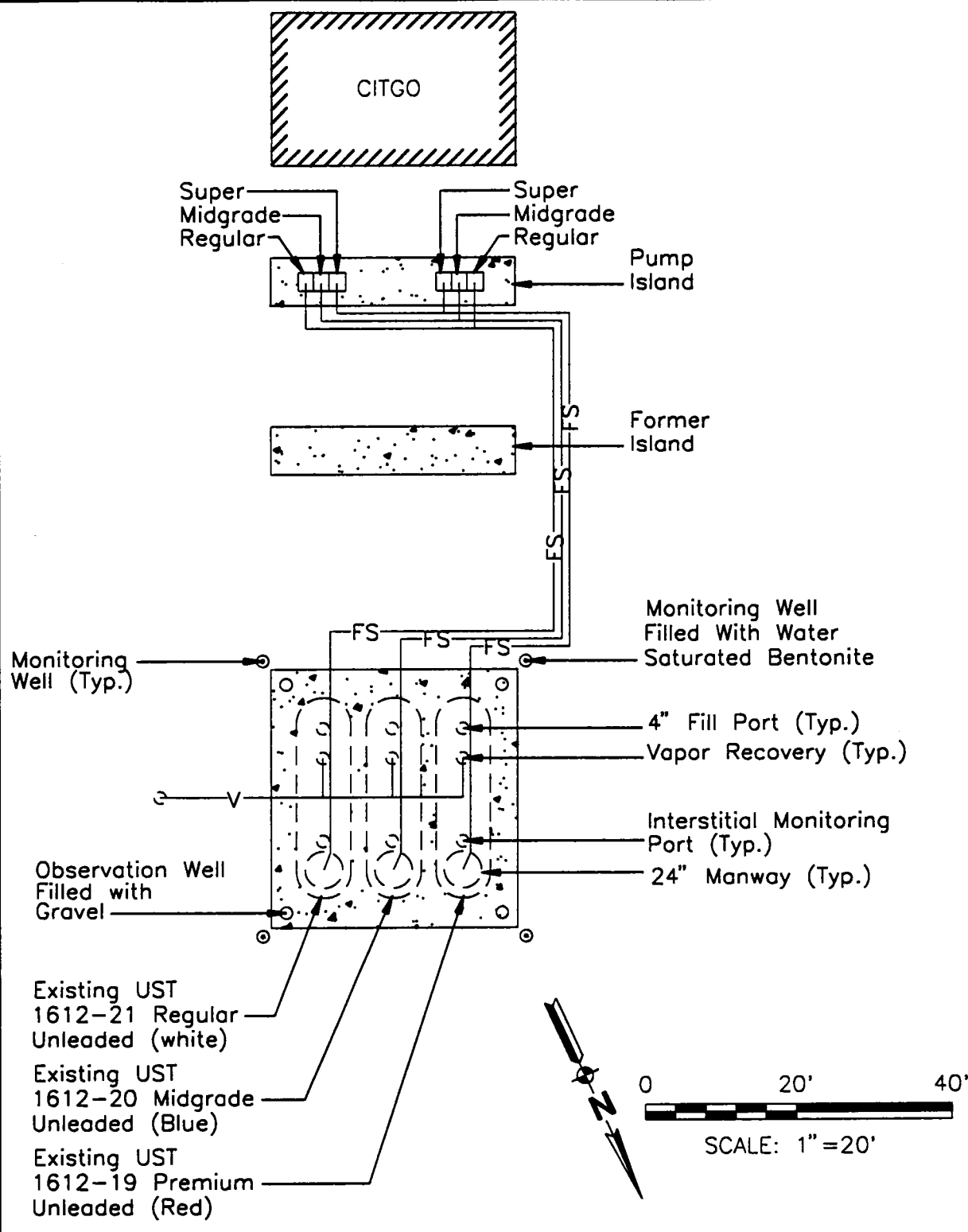
Figure 4
 UST 1558-94-1 (8,000 Norpar UST)
 UST 1558-95-2 (8,000 Norpar UST)
 UST 1558-94-3 (4,000 Waste Oil UST)

SURTASS
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore



AMPHIBIOUS DRIVE



MIDWAY DRIVE

LEGEND:

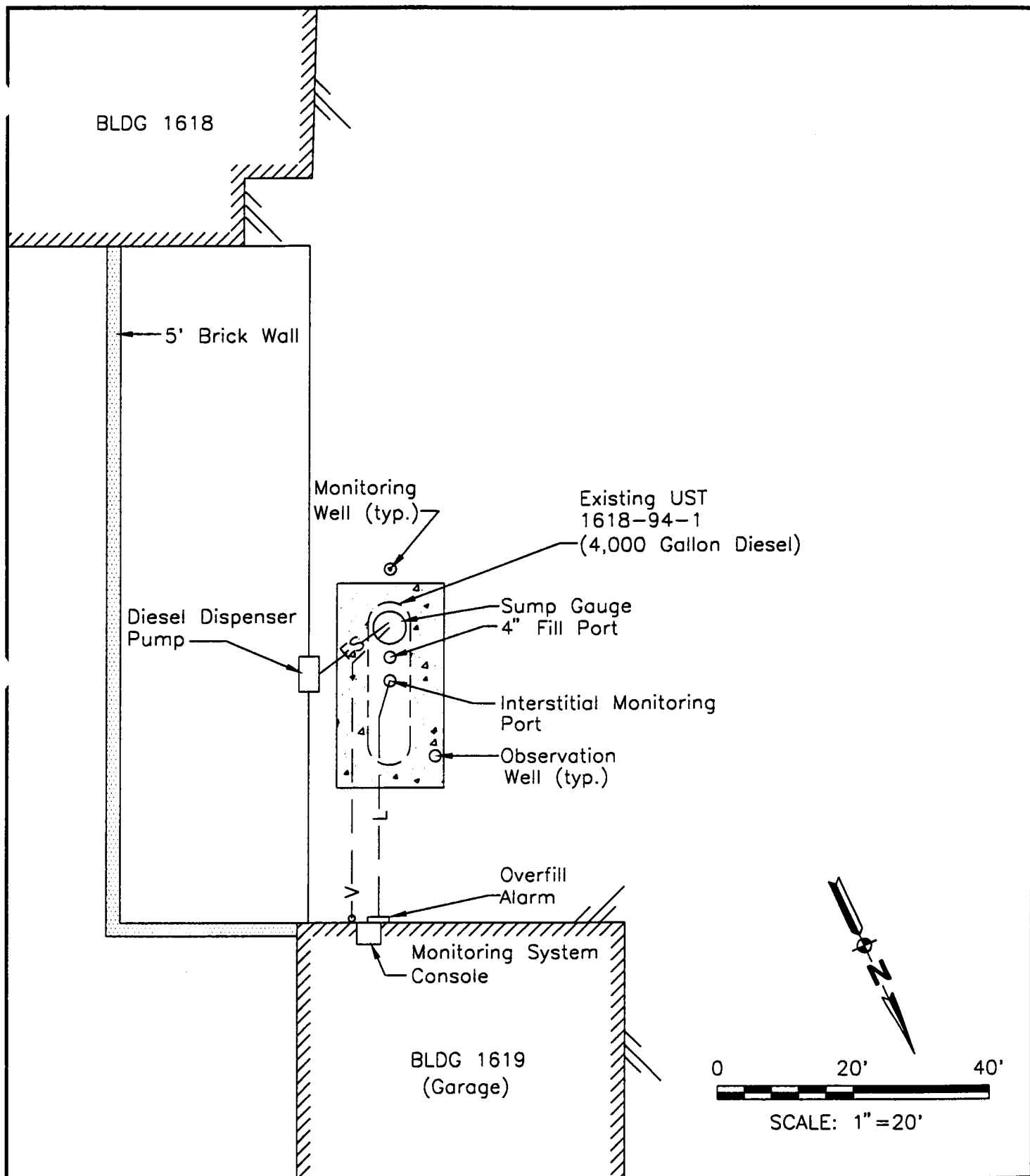
- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V — Vent Line
- ⊗ Bollards
- ≡ Asphalt

UST 1612-19 (10,000 Gallon Premium Unleaded Gasoline UST)
 UST 1612-20 (10,000 Gallon Midgrade Unleaded Gasoline UST)
 UST 1612-21 (10,000 Gallon Regular Unleaded Gasoline UST)
 CITGO (Gate 1)

NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore

Figure 6



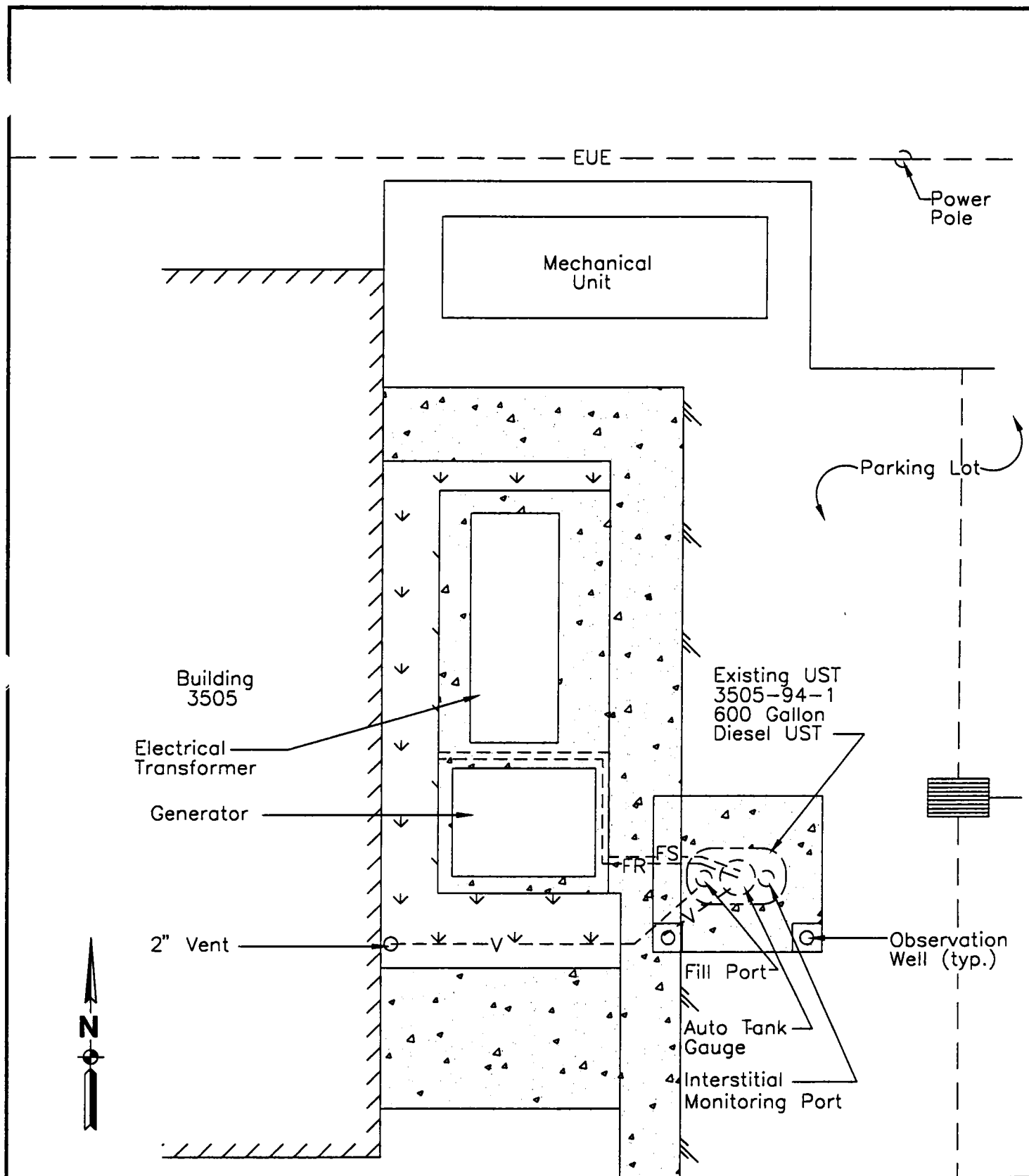
LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ▨ Asphalt

Figure 7
UST 1618-94-1 (4,000 Gallon Diesel UST)

EOD Area
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore

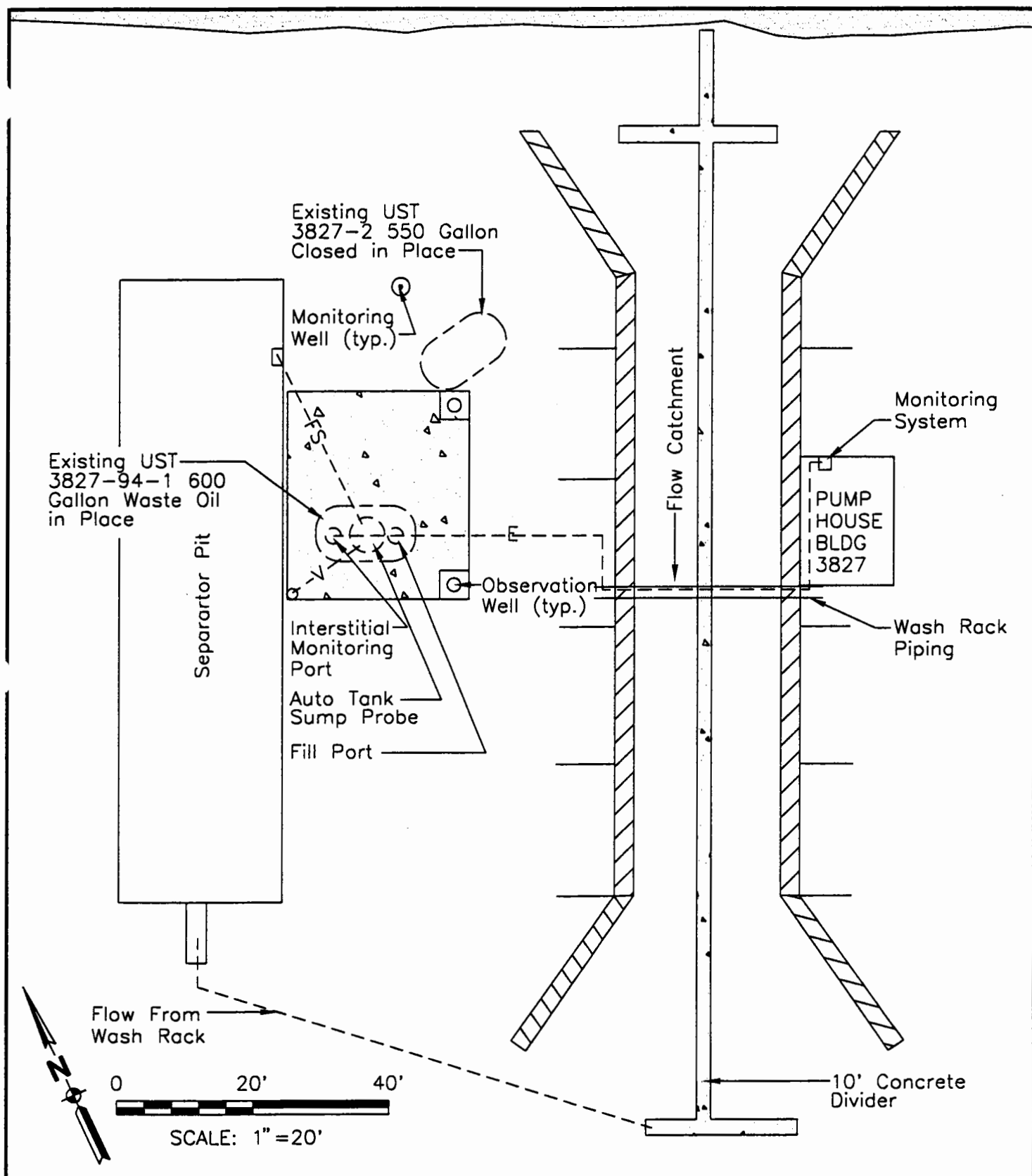


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ↘ Asphalt

Figure 8
UST 3505-94-1 (600 Gallon Diesel UST)
Hospital
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore

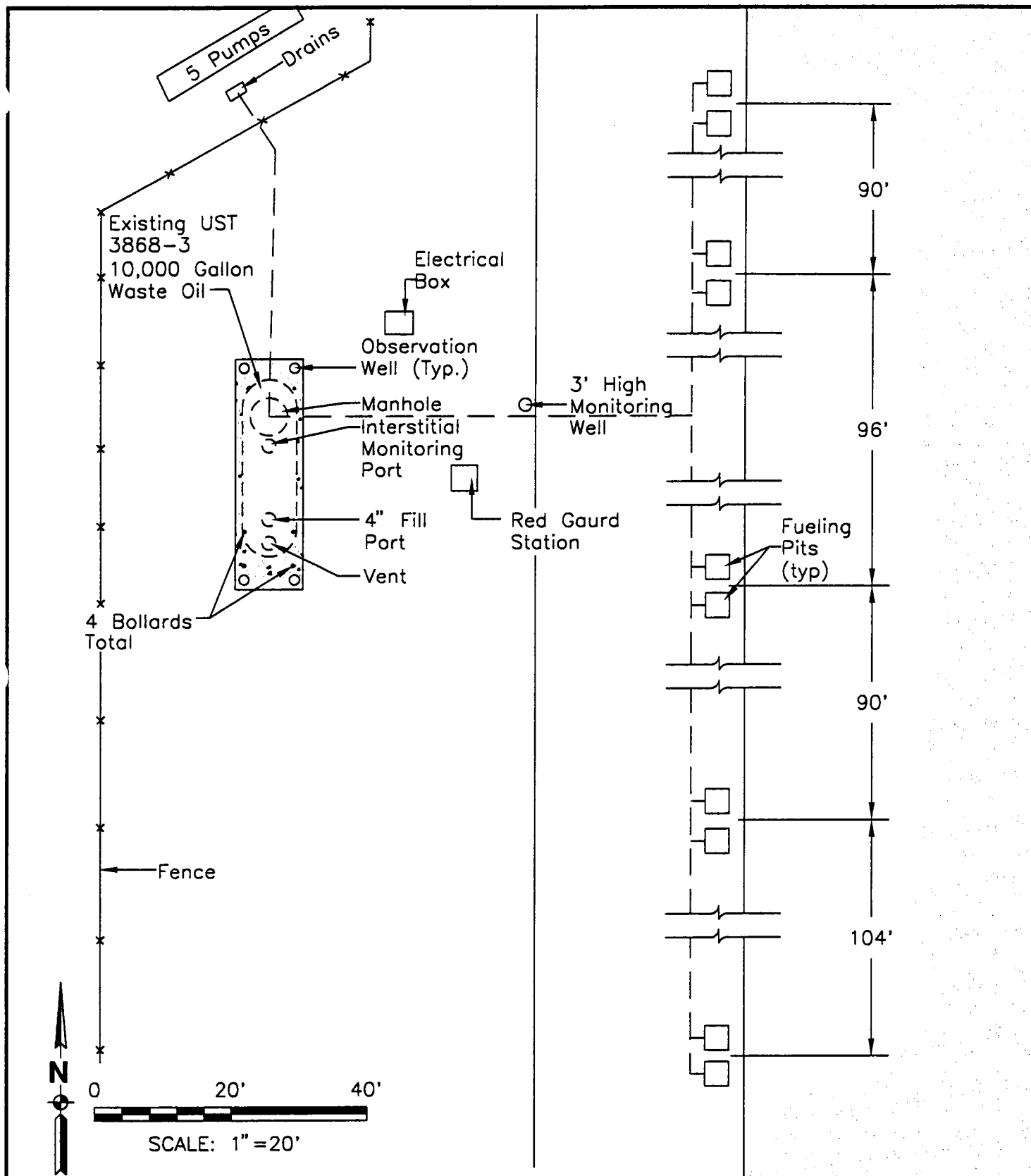


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ≡ Asphalt

Figure 9
 UST 3827-2 (550 Gallon Closed in Place)
 UST 3827-94-1 (600 Gallon Unleaded Waste Oil UST)
 ACU-4 Wash Rack
 NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore



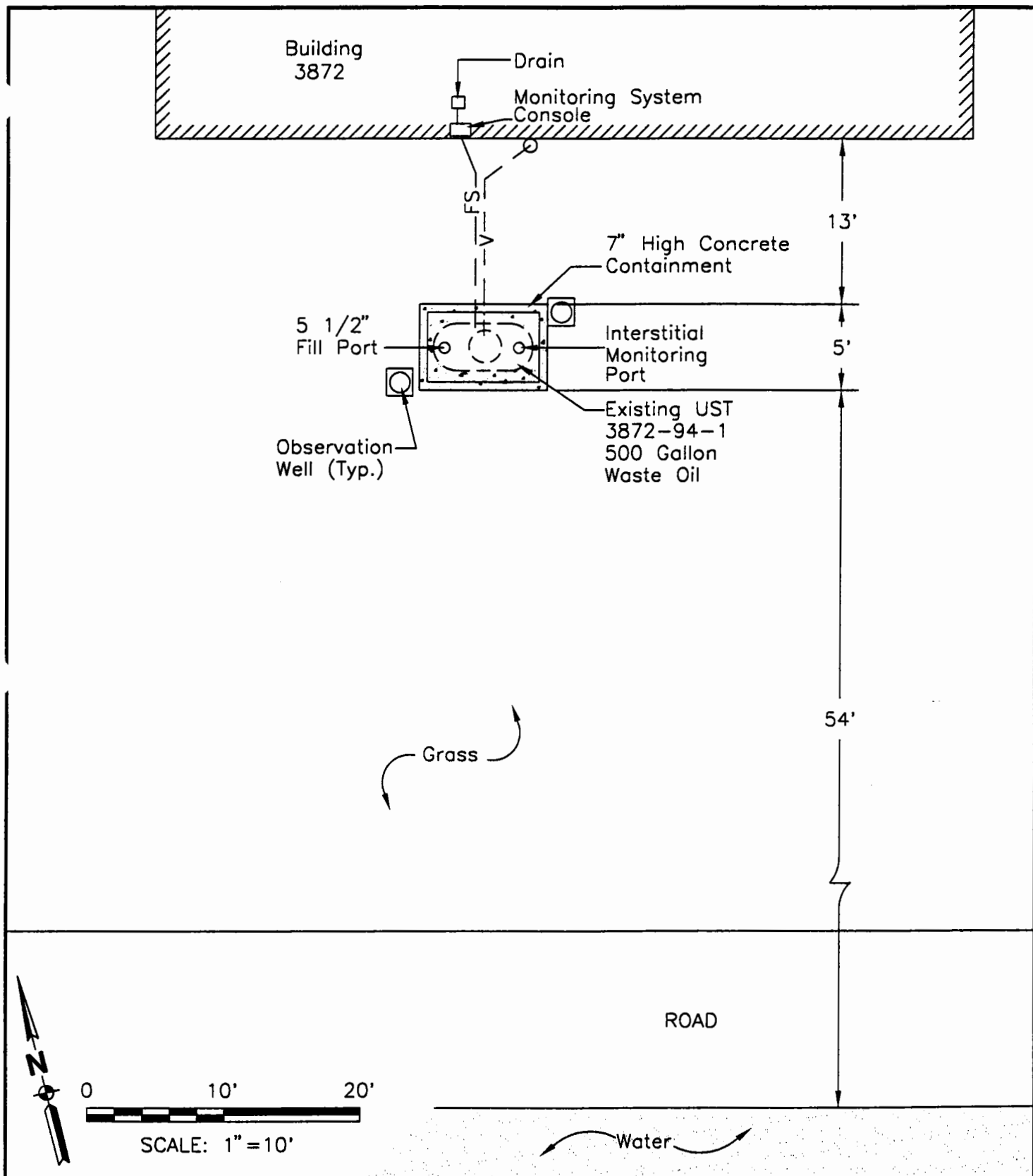
LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊙ Bollards
- ≡ Asphalt

Figure 10
UST 3868-3 (10,000 Gallon Waste Oil UST)

DC Fuel Farm
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore



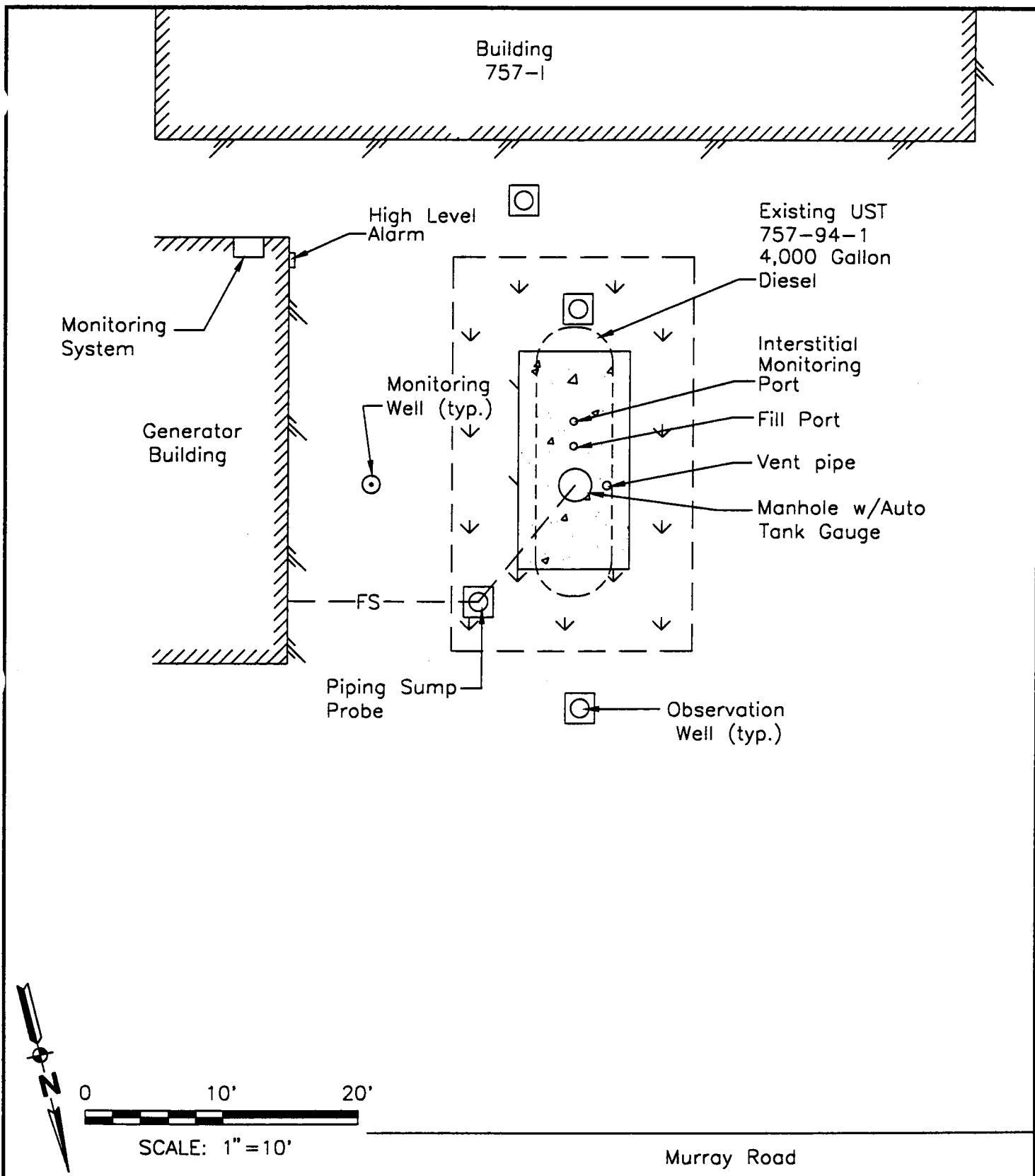
0 10' 20'
SCALE: 1" = 10'

LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ≡ Asphalt

Figure 11
UST 3872-94-1 (500 Gallon Waste Oil UST)
Applied Instructors Bldg. (Warfare School)
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore

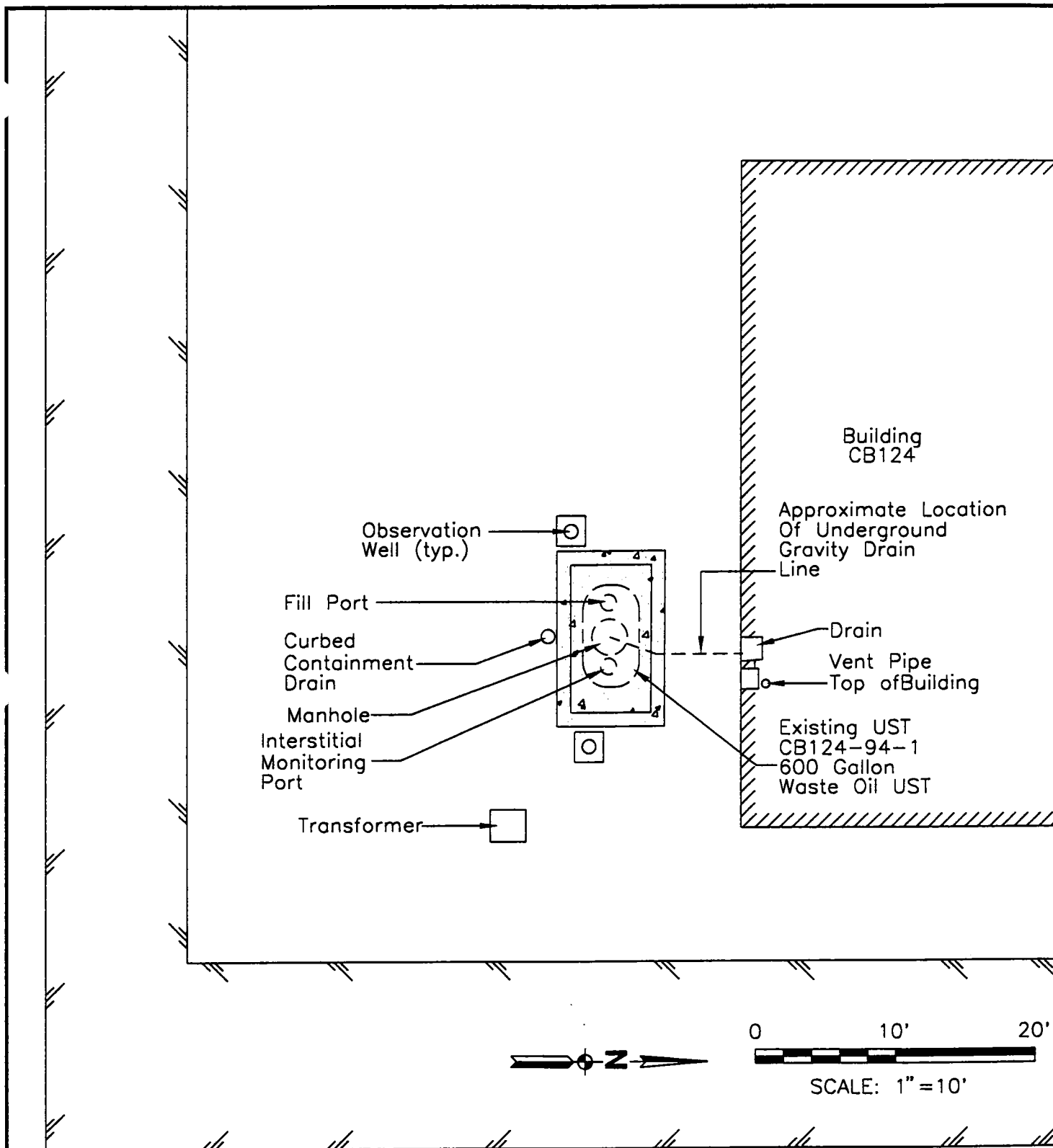


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- /// Asphalt

Figure 12
 UST 757-94-1 (4,000 Gallon Diesel UST)
 Steam Plant
 NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore

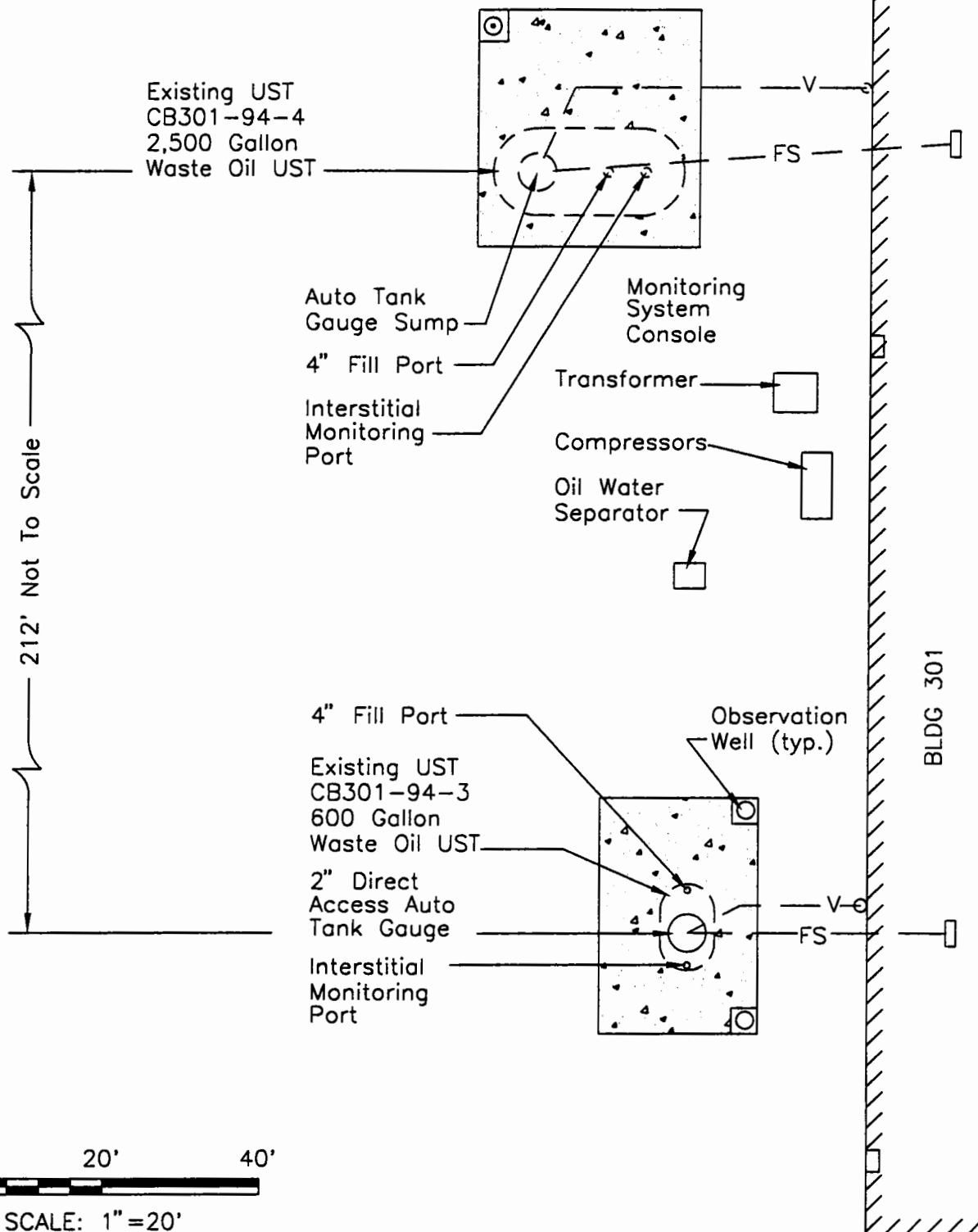


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ▨ Asphalt

Figure 13
UST CB124-94-1 (600 Gallon Waste Oil UST)
CB Operations/Maintenance
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore

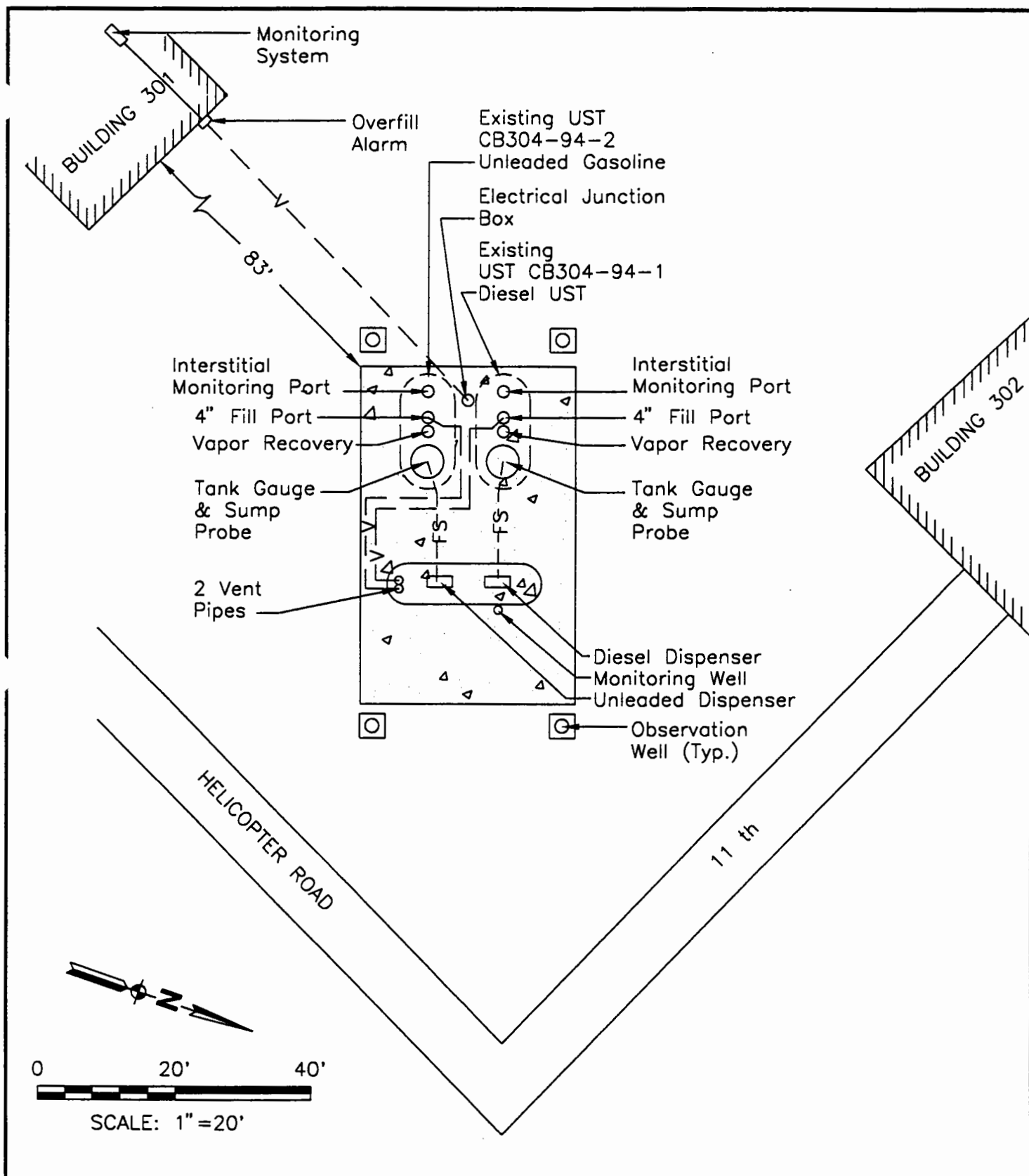


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ≡ Asphalt

Figure 14
UST CB301-94-3 (600 Gallon Waste Oil UST)
UST CB301-94-4 (2,500 Gallon Waste Oil UST)
CB Vehicle Maintenance
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore

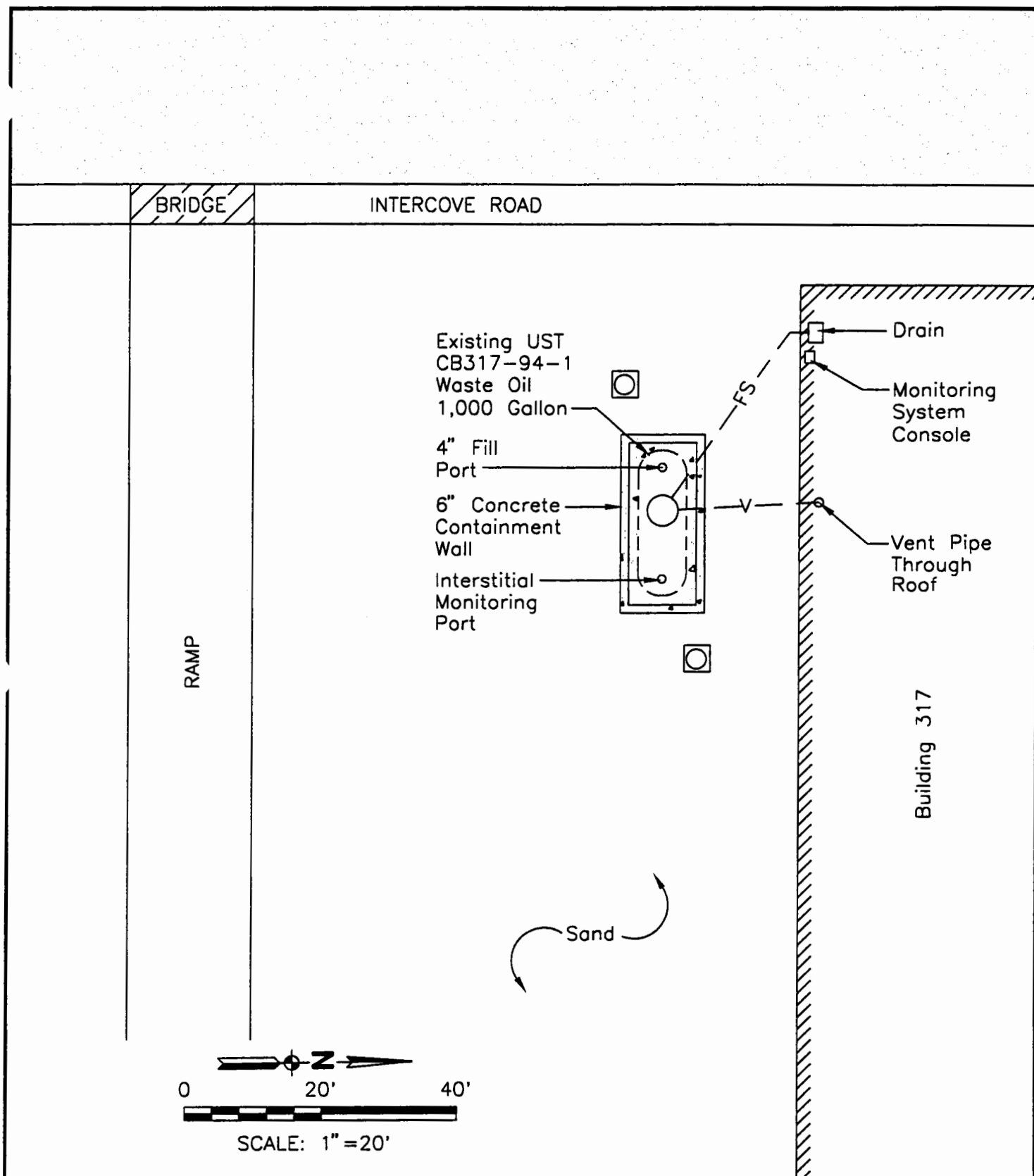


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ▨ Asphalt

Figure 15
 UST CB304-94-1 (6,000 Gallon Diesel UST)
 UST CB304-94-2 (6,000 Gallon Unleaded Gasoline UST)
 CB Gas Filling Station
 NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore

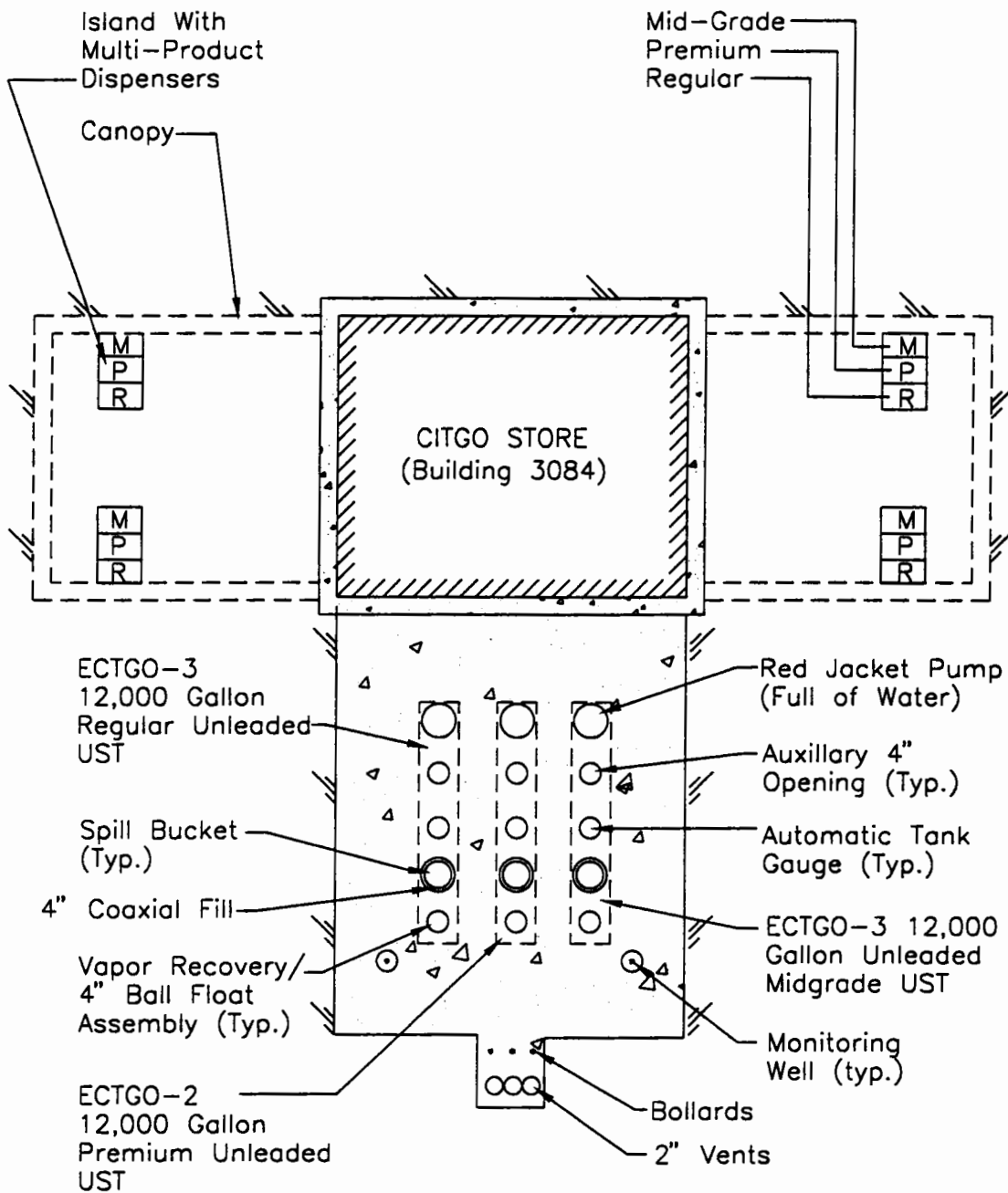


LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V — Vent Line
- ⊗ Bollards
- ≡ Asphalt

Figure 16
UST CB317-94-1 (1,000 Gallon Waste Oil UST)
CB Warehouse
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore



LEGEND:

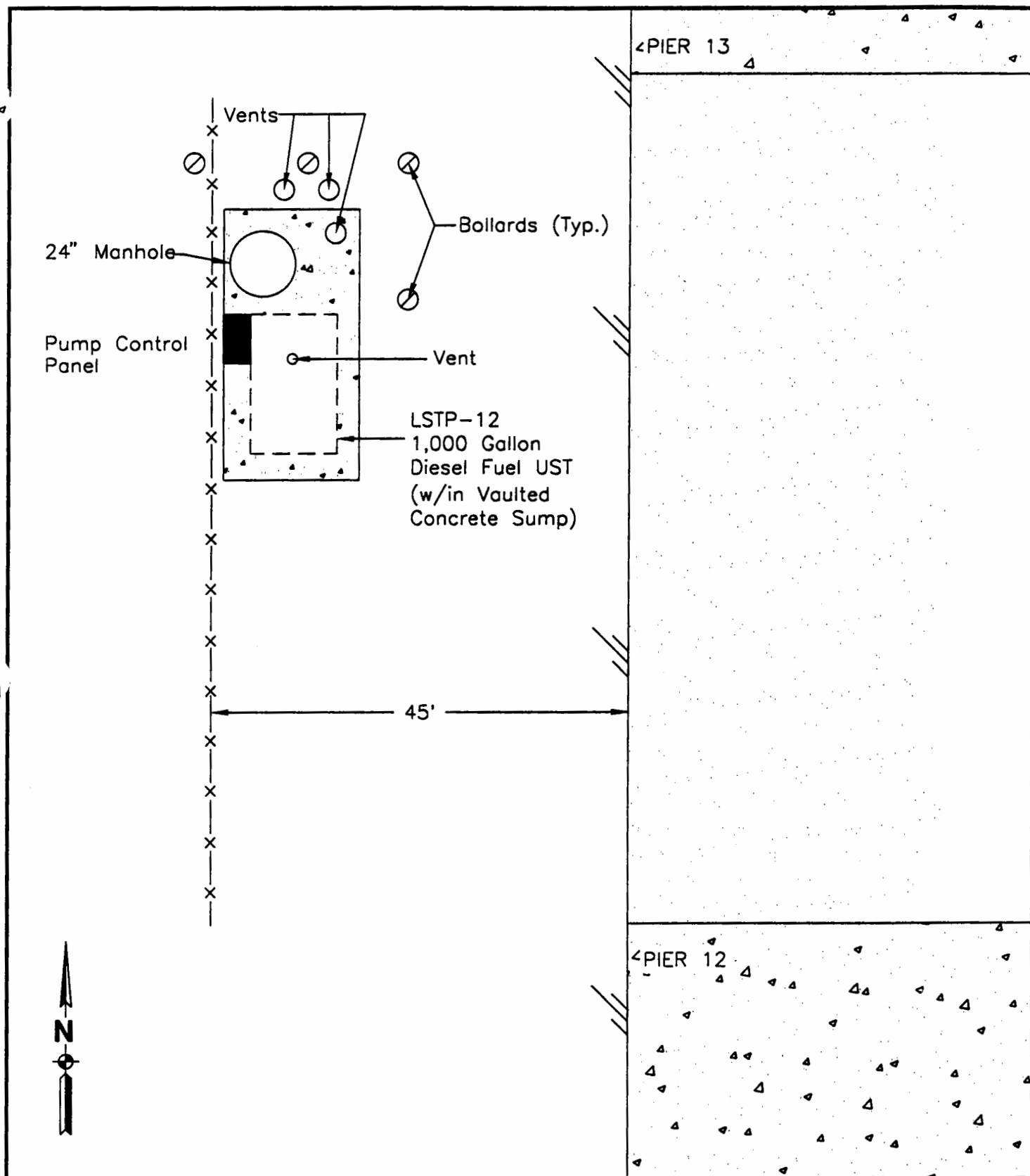
- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V — Vent Line
- ⊙ Bollards
- ≡ Asphalt

Figure 17

UST ECTGO-1 (12,000 Gallon Midgrade Unleaded UST)
 UST ECTGO-2 (12,000 Gallon Premium Unleaded UST)
 UST ECTGO-3 (12,000 Gallon Regular Unleaded UST)

CITGO (Gate 5)
 NAVPHIBASE LCREEK
 Norfolk, Virginia

Dames & Moore



LEGEND:

- FR— Fuel Return
- FS— Fuel Supply
- ⊙ Monitoring Well
- Observation Well
- V— Vent Line
- ⊗ Bollards
- ▴ Asphalt

Figure 18
UST LSTP-12 (1,000 Gallon Diesel UST)
Piers 12 and 13
NAVPHIBASE LCREEK
Norfolk, Virginia

Dames & Moore